UNIVERSITY OF ALBERTA

NUTRITION EVIDENCE IN PRACTICE
HOW HEART HEALTH PROMOTION AND GUIDELINES ARE USED BY DIETITIANS AND REGIONAL HEALTH AUTHORITIES

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN

PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Doctor of Philosophy

in

Nutrition and Metabolism

Department of Agriculture, Food and Nutritional Science

Edmonton, Alberta

Spring, 2007

Library and Archives Canada

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Ottawa ON K1A 0N4
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Direction du Patrimoine de l'édition

395, rue Wellington
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Your file Votre référence
ISBN: 978-0-494-29768-1
Our file Notre référence
ISBN: 978-0-494-29768-1

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Abstract

The purpose of this thesis was to investigate the use of nutrition evidence by dietitians and regional health authorities, and to explore contextual factors influencing implementation of heart health nutrition evidence in practice. Dietitians (n=20) in a health region working at provider and management levels were recruited to participate in focus groups to explore their perceptions and practices of heart health promotion, and to discuss how they use research and guidelines in practice. Dietitians working in heart health in health regions across the province, were then surveyed (n=51) regarding their knowledge, beliefs, confidence and frequency in addressing both individual and environmental risk conditions for cardiovascular disease, sources of evidence, and guideline implementation. Staff (n=144) working at the board/senior executive, management and service provider levels from health regions were recruited to participate in the Alberta Heart Health project and complete 4 cross –sectional surveys over 5 years to assess the health region's capacity for health promotion. Focus groups and key informant interviews (n=24) were conducted in three health regions of high, medium and low capacity. Qualitative data were analysed from both a health promotion and diffusion of innovations theory perspective.

Dietitians and health regions reported implementation of individual approaches to cardiovascular risk reduction such as developing personal skills, and addressing physiological, behavior, and psychosocial risk factors. There is a lack of awareness of health promotion concepts amongst dietitians, with dietitians reporting limited understanding of environmental risk conditions for cardiovascular disease. Health regions reported support for a health promotion approach however had limited

involvement in creating supportive environments, reorienting nutrition service and no involvement in developing healthy public policy. Dietitians reported using nutrition evidence to support the content as compared with the process of care, and indicated discussion with colleagues, and review articles as top sources of evidence. Emerging from this research was the importance of leadership and infrastructure in influencing nutrition evidence implementation.

Implications for practice include development of further evidence to support implementation of a population health perspective, provide infrastructure support, and opportunities for communication of best practices amongst dietitians and health regions.

DEDICATED TO

DOUGLAS JOHN WATTERS

ACKNOWLEDGEMENTS

I would like to thank my supervisor Dr. Kim Raine for her guidance, support and expertise during my graduate studies. I have appreciated the opportunity to work with her.

I would like to thank my supervisory committee members, Dr. Catherine Field, Dr. Ron Plotnikoff for their advice and mentorship.

I would like to acknowledge Dr. Donna Anderson and Cynthia Smith with the Alberta Heart Health Project, and the Danone Institue of Canada for funding the dietitian study. I would also like to acknowledge receipt of a Canadian Institute of Health Research fellowship in cardiovascular research, a Graduate Award sponsored by Dietitians of Canada, funding support from the Alberta Heritage Foundation for Medical Research, and from the University of Alberta to present findings at the Dietitians of Canada conference, International Congress on Nutrition and the International Congress on Dietetics.

Thanks to all the dietitians and regional health authority staff who shared their views and gave of their time to participate in these studies. Thanks to Janice Sorensen for her assistance in conducting focus groups and transcribing audio-tapes.

I would like to especially thank both my husband Doug Watters for his ongoing love and encouragement, and my parents Alex and Carol Stewart for their great 'in- kind' support. Thanks to Alexa for her patience during the many interrupted nights and to my extended family and friends for their understanding for the times I was unavailable due to working on my thesis.

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LIST OF ABBREVIATIONS

1°	primary care
2°	secondary care
3°	tertiary care
ADA	American Dietetic Association
AHA	American Heart Association
AHHP	Alberta Heart Health Project
AHW	Alberta Health and Wellness
AMA	Alberta Medical Association
ANOVA	Analysis of Variance
CCHS	Canadian Community Health Survey
CCS	Canadian Cardiovascular Society
CDP	Chronic Disease Prevention
CHD	Coronary Heart Disease
CHHI	Canadian Heart Health Initiative
CHSRF	Canadian Health Services Research Foundation
CIHI	Canadian Institute for Health Information
CME	Continuing Medical Education
CPG	Clinical Practice Guideline
CVD	Cardiovascular Disease
DC	Dietitians of Canada
DOI	Diffusions of Innovations
EBM	Evidence based medicine
EBP	Evidence based practice
HC	Health Canada
HHP	Heart Health Promotion
HP	Health Promotion
M	Management
MI	Myocardial Infarction
MNT	Medical Nutrition Therapy
NCD	Non-communicable Disease
NCEP	National Cholesterol Education Program
RCT	Randomised controlled trial
RD	Registered Dietitian
RHA	Regional Health Authority
SES	Socioeconomic status
TLC	Therapeutic Lifestyle Changes
WHO	World Health Organization

CHAPTER 1. OVERVIEW OF THE STUDY

1.0 Introduction

The overall purpose of this thesis is to investigate how heart health nutrition evidence is incorporated into the practice of dietitians and regional health authorities. More specifically, the purpose is to describe the extent to which nutrition evidence is used in practice and to investigate contextual influence on use of nutrition evidence. Understanding what enables dietitians and regional health authorities to use nutrition evidence in their practice is central to developing strategies to increase research utilization and knowledge transfer.

Chapter 1 includes an introduction to the research and provides an overview of the rationale and background for the study. The objectives and specific research questions are identified.

Chapter 2 summarizes the related literature and highlights the current state of knowledge relating to why reduction in the burden of cardiovascular disease is important, what evidence exists for nutrition and cardiovascular disease from both an individual and health promotion perspective, and how nutrition evidence is synthesized, disseminated and implemented in practice. Included in chapter 2 is the theoretical basis for knowledge transfer.

Chapter 3 examines dietitians' perceptions about heart health promotion, and their knowledge and practices addressing risk factors and conditions that influence heart health promotion.

Chapter 4 explores dietitians' experiences and perceptions incorporating heart health nutrition research within their practice. In particular, how dietitians use research, what sources of research and information do dietitians use, and what are the facilitators and barriers to heart health guideline use by dietitians.

Chapter 5 investigates dissemination of nutrition in heart health promotion in a regionalized health system. In particular, the goal was to explore contextual influences on the successful implementation of nutrition evidence within health regions.

Chapter 6 presents a summary discussion of findings, general themes, implications, recommendations for practice and further research.

1.2 Rationale for the study

Cardiovascular disease remains the leading cause of morbidity and mortality amongst Canadians. In 1998, it was estimated the total cost of cardiovascular disease to the Canadian economy was approximately $18.5 billion, more than any other disease (Health Canada, 1998). The prevalence and burden of cardiovascular disease is expected to increase, since 80% of Canadians have at least one risk factor for cardiovascular disease (Heart and Stroke Foundation, 2003).

Fortunately the evidence for prevention and treatment of cardiovascular disease is amongst the best for any clinical area (McClaren, 2001). In particular, considerable research has been done on risk factors that predict and can be modified to prevent the development of cardiovascular disease. Traditionally the focus has been on individual risk factors at the physiological (blood pressure, blood cholesterol, obesity, genetic factors), behavioral (smoking, poor diet, physical inactivity) and psychosocial (lack of social support, stress, low self-esteem, low socio-economic status) levels, with more recent awareness of the effects of environmental risk conditions (poverty, poor work conditions, discrimination, income and neighborhood inequality) on cardiovascular disease. There is increased recognition that in addition to a person's individual characteristics and behaviors, the physical, social and economic environment have a considerable impact on determining cardiovascular disease. Health promotion is concerned with addressing these determinants of health to enable people to increase control over, and to improve, their health (Ottawa Charter for Health Promotion, 1986).

However knowledge of health promotion has not necessarily been transferred into practice. Little has been done to investigate the degree of adoption and implementation of health promotion by dietitians or regional health authorities. It is not known how dietitians perceive health promotion and utilize principles in their practice. In addition, how dietitians working in the area of heart health, use nutrition evidence in their practice has not been studied. The editor of the Journal Human Nutrition and Dietetics recently wrote an editorial requesting manuscripts describing the evaluation of the guidelines' impact on clinical practice (Gandy, 2006). Learning how nutrition in heart health promotion is used by regional health authorities will contribute to a greater understanding of the context dietitians work within.

Finding out how dietitians and regional health authorities use nutrition evidence, will identify areas to target for increased evidence uptake and implementation. Without intervention to decrease the known risk factors and conditions for cardiovascular disease and addressing the broader determinants of health, the burden of cardiovascular disease will increase.

1.3 Background to the study

1.3.1 Dietitians

Dietitians are experts on food and nutrition who translate the science of nutrition into healthy food choices (Dietitians of Canada, 2002). Dietitians develop, implement and evaluate food and nutrition strategies to promote health and treat disease; manage food service systems; and develop and deliver related programs and policies (Alberta Human Resources and Employment, 2006). Dietitians' scope of practice includes "translation and application of the scientific knowledge of foods and human nutrition towards the attainment, maintenance and promotion of health of individuals, groups, and the community and includes but is not limited to assessing the overall nutritional needs of a community in order to establish priorities and influence policies which provide the nutritional component of health promotion program" (Dietitians of Canada, 1997, pg. 1).

In Alberta there are over 800 dietitians, with the majority (80%) of dietitians working in healthcare (Alberta Human Resources and Employment, 2006). Dietitians have a specific role in translating nutrition evidence into practice to promote health of both individuals and populations. Unlike a considerable body of research that exists for nurses (Whitehead, 2006; Davis, 1995) and physicians (McKinlay, 2005), no research has been done on how dietitians perceive health promotion. Likewise, little research has been done on how nutrition evidence and in particular heart health research is transferred into dietetic practice.

1.3.2 Regional health authorities

In 1994, healthcare in Alberta was transformed from over 200 health boards to 17 regional health authorities (RHA) to contain costs and better integrate and coordinate services. RHAs are geographically defined regions that are responsible for managing long and short term healthcare services (hospitals, continuing care facilities, community health services) as well as public health programs including health promotion and risk reduction.

Before regionalization, health promotion was under a separate administration from hospitals and did not have to compete with acute care services for funding. For example, prior to the formation of the health regions, cities had a Board of Health that often had community development offices that worked in health units in low-income areas (Bernier, 2005).

RHAs assess the health needs of their region and determine priorities in providing health services in the region and allocate resources accordingly. Since most public health programs are implemented based on the regional needs and priorities, there is variation in the type of health promotion programs available in the different regions.

There have been significant fiscal constraints in the delivery of health care and pressure on governments to reduce healthcare costs. Upon establishment of Alberta's RHAs, they

were required to plan for an 18% reduction in expenditures (Lewis, 2001). The importance of regional health authorities meeting the province's accountability requirements for a balanced budget was seen in 2002 when a health region was dissolved by the provincial health department and became part of other regions, when it submitted a business plan projecting significant financial deficits. In 2003, the RHAs were restructured from 16 regions into 9 health regions with integration of mental health services. Also at that time, many of the RHAs changed their names and removed the word 'authority' from their name (i.e. "Capital Health Authority" became "Capital Health"). However each health region is still governed by the Regional Health Authority Act, and the terms regional health authority and health region are used interchangeably.

As a consequence of the restructuring there was large reduction in use of acute hospital services and the average care intensity rose significantly (Saunders, 1999) resulting in significantly increased workloads of staff left working in acute hospitals. Physicians perceived the emphasis of regionalization to be on controlling costs rather than patient satisfaction, evidence-based medicine or health status of the community (Triska, 2005). In a context of expenditure reductions and restructuring, it became difficult for health promotion programs to compete for funding with acute care services (Bernier, 2005).

With the shift of responsibility for healthcare delivery from the provincial to the regional level, there were also changes made at the provincial level where the role of provincial nutritionists and other content experts in various aspects of public health were disbanded. This is unlike other western provinces (BC, Saskatchewan and Manitoba) which have also undergone regionalization of health care, however have maintained provincial public health infrastructure and regional nutrition positions.

1.3.3 Alberta Heart Health Project

The Alberta Heart Health Project (AHHP) was part of the Canadian Heart Health Initiative began in 1986 as a federal/ provincial strategy to build public health capacity for cardiovascular disease prevention. It was begun at a time when population surveys of

cardiovascular disease risk were being carried out across the provinces. Provincial Heart Health surveys (1987 – 1991) indicated that two of three adult Canadians had one or more of the major risk factors for cardiovascular disease (Alberta Health, 1990). Also during that time the Canadian Consensus Conference on Cholesterol (Canadian Consensus Conference, 1988) was convened which proposed interventions which required a public health approach and to include many sectors of society. A 1992 report of the Federal Provincial Working Group on the Prevention and Control of Cardiovascular Disease stated "dietary change is the cornerstone of the public health approach," and indicated that "the creation of consumer environments support of healthy food choices involves working with different sectors and levels of government (regulatory, health promotion), voluntary health agencies, the food industry and consumers' associations" (O'Connor, 1992, pg 21).

The AHHP was launched in 1990 along with the Alberta Heart Health survey which found 56% of Albertans had one or more risk factors for cardiovascular disease. The demonstration phase of the AHHP was lead by Alberta Health from 1993 – 1998 and focused on community capacity building in schools, workplaces and rural communities across the province to address tobacco use, better nutrition and physical inactivity as risk factors for heart health. The dissemination phase of the AHHP was lead by the University of Alberta's Centre of Health Promotion Studies from 1999 - 2005, and focused on implementation of heart health promotion in regional health authorities (Smith, 2001).

1.4 Research Questions

There were three major research questions requiring investigation. First what does health promotion mean to dietitians working in the area of heart health? Second, how do heart health dietitians use evidence in their practice? Third, how is nutrition in health promotion implemented by regional health authorities? In addition to these three general questions, specific research questions listed below were developed.

1.4.1 What are dietitians' perceptions and practices of heart health promotion?

The purpose of this study was to explore dietitians' perceptions, knowledge and practices, and context of implementing heart health promotion within their practice. In particular:

1) What does heart health promotion mean to dietitians?

2) What are dietitians' knowledge and practices addressing risk factors and conditions that comprise heart health promotion?

3) What is the estimated level of heart health implementation in dietitians' practices?

4) What contextual factors influence implementation of heart health promotion in dietitians' practices?

1.4.2 How do dietitians use heart health research and guidelines in practice?

This research explores dietitians' experiences and perceptions of incorporating nutrition research within their practice. In particular:

1) How do dietitians use research in different situations or contexts?

2) What sources of knowledge do dietitians use in their practice?

3) What is the estimated level of guideline use in dietitians practices?

4) What contextual factors do dietitians perceive as facilitators and barriers to guideline implementation?

1.4.3 How is heart health nutrition implemented in health regions?

This study investigates the dissemination of nutrition in heart health promotion in regional health authorities using quantitative and qualitative approaches, according to health promotion concepts and diffusion of innovations theory (Rogers, 1995). In particular:

1) What is the estimated level of nutrition in heart health implementation in regional health authorities?

2) What contextual features are associated with the successful implementation of nutrition in heart health nutrition by health regions?

Thus the overall aim of this thesis is to study how heart health nutrition evidence is implemented in practice by dietitians and health regions, and explore the contextual

influences of implementing heart health nutrition evidence in practice by dietitians and health regions.

1.5 Researcher's perspective

One of the key goals of qualitative research is to understand the phenomenon of interest from the participant's perspective, not the researcher's. Thus it is important to openly acknowledge the perspective of the researcher and their background and experience that may impact the analysis and interpretation of data.

My interest in knowledge utilization comes from my previous employment and research positions. First I was involved in nutrition and metabolism research, then as a dietitian working at the provider level as a clinical dietitian in cardiac rehabilitation, and then at the management level in a regional health authority where I was responsible for education and professional development of dietitians.

Being involved in nutrition and metabolism research, I became aware of the considerable volume of research being produced and published on a regular basis. As a clinical dietitian it was challenging to keep up to date with the latest nutrition research and apply it in practice. My role in educating dietitians broadened my perspective on how best to communicate and present information to impact the practice of dietitians. I became interested in research translation and was fortunate to attend a "Conversations in Dissemination" conference conducted by the Alberta Consortium for Health Promotion Research with Jonathon Lomas, Penny Hawe and Kim Raine as presenters. Subsequent discussion with Dr. Raine indicated the opportunity to become involved with the Alberta Heart Health Project which was investigating the dissemination of research into practice by regional health authorities.

It has been advantageous to be in involved the Alberta Heart Health Project throughout the dissemination phase. I participated in data collection (focus group and document review) and analysis, made suggestions for intervention (data presentation via a report

card) and shared findings via poster and oral presentations at national and international conferences.

My previous experience conducting and publishing studies using both qualitative and quantitative approaches was useful in the study involving the dietitians. My understanding of qualitative methodology was broadened by completing a graduate level course on Qualitative Methods and by attending a Qualitative Workshop conference organized by the International Institute for Qualitative Methodology. I was aware of the potential to bias data collection if I moderated the dietitian focus groups, so an external facilitator was used to conduct the focus groups. Since moderator bias may be introduced if the moderator of the focus group is too involved with the topic or is perceived to have particular viewpoints or beliefs about the topic (Krueger, 1994). However being in attendance as a research assistant during the focus groups was beneficial to probe for more information or ask for clarification as needed.

The other viewpoint that I have brought to this research is my interest in expanding my skills and knowledge in new directions. It was challenging to change from an empiricist perspective and looking at the predictive nature of theories and concepts to an orientation of understanding behavior of individuals and organizations from a social perspective and looking at the explanatory nature of theories.

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CHAPTER 2. LITERATURE REVIEW

The following literature review outlines the foundation upon which this thesis is based. The chapter is organized into four sections. The first section describes the prevalence and burden of cardiovascular disease in Canada. The second section provides an overview of the development of cardiovascular disease both from an individual and population health perspective. The third section provides an overview of evidence based practice, and the development of clinical practice guidelines. The fourth section reviews the theoretical literature regarding dissemination and implementation of research in both individuals and organizations.

2.1 Heart Health and Cardiovascular Disease

2.1.1 Prevalence and Burden of Cardiovascular Disease

Cardiovascular disease remains the leading cause of death and disability, accounting in 1999 for 36% of deaths in Canada (Heart and Stroke Foundation, 2003). The principal components of cardiovascular disease are heart disease and stroke, with 20% due to ischemic heart disease, which includes acute myocardial infarction, 7% due to cebrovascular disease, which is primarily stroke, and 9% due to other cardiovascular diseases such as congestive heart failure and peripheral vascular disease. In 1999, the overall age-standardized mortality rate for cardiovascular disease in Canada was 233 per 100,000.

Regional variation in cardiovascular disease exists both nationally and provincially. Newfoundland has the highest death rate from cardiovascular disease at 304 per 100,000, and Nunavut and the Northwest Territories have the lowest mortality at 200 per 100,000 (Filate, 2003). Alberta has the fifth highest mortality rate from cardiovascular disease at 240 per 100,000 in comparison with the other provinces and territories and is higher than the national average of 233 per 100,000 (Statistics Canada, 2002). Within Alberta the

northern region has the highest at 355 with the large urban centers lowest at 240 age-standardized cardiovascular mortality rate per 100, 000 population (Filate, 2003).

The economic costs of cardiovascular disease are significant. In 1998, it was estimated that 11.6% of the total cost of all illnesses on the health care system was due to cardiovascular disease and was the highest amongst all diseases (Health Canada, 2002). Cardiovascular disease at 18% of admissions also represents the highest contributor to hospitalization than any other health problem (Heart and Stroke Foundation, 2003).

In addition to the impact of cardiovascular disease on mortality, since many individuals live with cardiovascular disease for many years, determining its prevalence, the number of individuals living with heart disease or stroke divided by the number of persons in the population (Gordis, 1996), is important in assessing the true burden of cardiovascular disease. In Canada, cardiovascular disease surveillance is based on administrative, physician billing, hospitalization and mortality data, none of which directly address disease prevalence. However the proportion of the population with cardiovascular disease can be estimated using data from the Canadian Community Health Survey (CCHS). Based on data from the 2000 CCHS, by the age of 70 years, 1 in 5 women and 1 in 4 men in Canada reported having been told by a physician they had cardiovascular disease (Heart and Stroke Foundation, 2003). However the actual prevalence of cardiovascular disease is probably higher given the under-reporting that occurs with self-reported data (Chow, 2005).

There are also impacts of living with cardiovascular disease on quality of life, restrictions on activity, requiring assistance with activities of daily living, and depression (Heart and Stroke Foundation, 2003). Compared with 21% of those without cardiovascular disease, 77% of those who have had a stroke and 59% of those with heart disease reported having activity restrictions. Those requiring assistance with activities of daily living range from 11% for those without cardiovascular disease to 50% for those with heart disease, and to 71% who have had a stroke. Thus in addition to healthcare and economic costs,

cardiovascular disease adds social costs to families and caregivers that are difficult to estimate.

Although mortality rates from cardiovascular disease have decreased considerably in Canada since the 1950s, with the rising prevalence of obesity in Canada (Belanger-Ducharme, 2005, Katzmarzyk, 2004) and adverse relationship between increasing obesity on cardiovascular risk factors such as blood pressure and total cholesterol (Joshi, 2005), HDL cholesterol (Denke, 1993) and increased mortality (Peeters, 2003), it is anticipated that without intervention there will be a reversal of this favorable trend and an increased incidence of cardiovascular disease in the future. Combined with the trend of increasing prevalence of cardiovascular disease due to the aging population and improved treatment and survival outcomes, the burden of cardiovascular disease is expected to increase (Heart and Stroke Foundation, 2003). From a provincial perspective, the highest growth in cardiovascular disease mortality rates is projected to be from Alberta based on the current levels of cardiovascular risk and being one of provinces with the fastest population growth (Foot, 2005). Strategies to reduce the incidence of cardiovascular disease are important on both an individual and population level.

2.1.2 Risk Factors for Cardiovascular Disease

Cardiovascular disease is generally due to a combination of several risk factors. Risk factors are conditions or behaviors that increases the chances of developing cardiovascular disease. Traditionally, cardiovascular disease prevention and treatment has been concerned with unifactorial assessment of individual risk factors such as hypertension and dyslipidemia. More recently, recommendations are beginning to focus on the overall level of risk based on multifactorial total cardiovascular disease assessment. This approach recognizes cardiovascular disease has multifactorial etiology, risk factors tend to cluster and be synergistic, and in health care and as clinicians the whole person and their community need to be considered, not isolated risk factors.

This section will review physiological (blood pressure, cholesterol, obesity, genetic) and lifestyle behavioral risk factors (smoking, poor diet, physical inactivity) as well as psychosocial risk factors and environmental risk conditions, their link to cardiovascular health, prevalence and strategies to improve outcomes.

2.1.2.1 Physiological factors

2.1.2. 1. 1 High blood pressure

High blood pressure raises the risk of cardiovascular disease. Blood pressure is strongly and directly related to mortality, with any increase over 115/75 mmHg associated with increased mortality (Lewington, 2002). Data from the Framingham Heart Study indicated even moderate elevations in blood pressure (130 – 139/85 – 89) are associated with a three times greater risk of cardiovascular events (Vasan, 2001).

The morbidity and mortality associated with hypertension are significant, and is implicated in 35% of all cardiovascular events and 24% of all premature deaths (Kannel, 1996). Data from the 1986-92 Canadian Heart Health Surveys which included physician based measurements, indicated 22% of men and 18% of women have high blood pressure, however only 16% were receiving appropriate treatment to reach target levels (Joffres, 1997). In Alberta in 2003, 12% of the population has high blood pressure, with regional variation from 13.5% in the northern/rural areas to 8.7% in Calgary and 11.3% in Edmonton (Tanuseputro, 2003). Rates for high blood pressure have increased substantially in Alberta from 8% in 1996, and similar increases have been seen across Canada. The reason for this increase could be due to increased screening (Heart and Stroke Foundation, 2003), as well as an increase in other risk factors such as obesity, poor diet and physical inactivity which contribute to high blood pressure.

Lifestyle modification is important for initial and ongoing management of hypertension. Weight loss of 5 kg results in an average reduction in systolic blood pressure of 7.2 and diastolic pressure of 5.9 (Pickering, 1997) and weight reduction enhances the blood pressure effect of medications (Wylie-Rosett, 1993). Sodium reduction and following the

DASH (Dietary Approaches to Stop Hypertension) diet which is low in fat, high in fruits, vegetables and lowfat dairy foods can reduce systolic by 11.4 and diastolic blood pressure by 5.5 (Appel, 1997).

2.1.2. 1. 2 High blood cholesterol or dyslipidemia

High total cholesterol (TC), high levels of low-density lipoprotein (LDL) cholesterol, and an elevated TC/HDL ratio are major risk factors for cardiovascular disease. In addition to high blood cholesterol, having low levels of high-density lipoprotein (HDL) cholesterol, or dyslipidemia, is also a major risk factor for cardiovascular disease.

The link between cholesterol and cardiovascular disease was first reported in 1913 by Anitschkow, where rabbits fed cholesterol developed atherosclerosis (Kritchevsky, 2001). Prospective epidemiological studies such as the Framingham study (Castelli, 1984) and the multiple risk factor intervention trial, MRFIT, (Stamler, 1986) indicated an exponential rise in cardiovascular mortality as serum cholesterol levels increased. The Framingham study which coined the term 'risk factors', quantified the atherogenic contribution of total cholesterol and HDL-cholesterol into an algorithm that predicts cardiovascular disease based on age, cholesterol levels, blood pressure and smoking status (Wilson, 1998). This risk calculation algorithm, with 2 of the 5 risk categories relating to dyslipidemia, has been incorporated into the US National Cholesterol Education Program Adult Treatment Panel III (NCEP, 2002) and the 2003 Canadian guidelines for the management and treatment of dyslipidemia (Genest, 2003). More recently, the INTERHEART study (Yusuf, 2004) reporting on 15,152 patients with myocardial infarction and 14,820 control individuals, indicated the population attributable risk of myocardial infarction due to abnormal lipid levels was 49%. Thus hypercholesterolemia or dyslipidemia remain a major risk factor for development of cardiovascular disease.

Data from the Canadian Heart Health Survey of approximately 18,000 individuals who had a blood sample taken between 1988 and 1992, indicated 45% of men and 43% of women had total cholesterol above 5.2 mmol/L (Heart and Stroke Foundation, 2003).

However this dataset underestimates the proportions of Canadians at risk for cardiovascular disease, since the number of Canadians with obesity and components of the metabolic syndrome which is associated with a marked increase in cardiovascular disease risk, have risen considerably over the last 15 years. More recent data are needed to determine the impact of dyslipidemia on cardiovascular disease both nationally and provincially.

2.1.2. 1. 3 Obesity

In the early 1900s, analysis of life insurance data in the US indicated obesity were associated with increased mortality (Harrison, 1985). After age and dyslipidemia, body weight was ranked by the Framingham Heart Study as the third most important predictor of cardiovascular disease (Hubert, 1983). Obesity is causally linked to dyslipidemia, hypertension and insulin resistance. Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults (National Heart, Lung, and Blood Institute, 2000), indicate based on randomized controlled clinical trial evidence, weight loss is recommended to lower blood pressure, total cholesterol, LDL-cholesterol and triglycerides, to raise HDL-cholesterol, and to lower blood glucose levels in persons with type 2 diabetes.

Classification of overweight and obesity are based on body mass index (BMI), which is a measure of weight in relation to height. According to the World Health Organization (WHO, 1998) and Canadian Guidelines for Body Weight Classification in Adults (Health Canada, 2003) obesity is classified into six categories each representing a different risk level. BMI < 18.5 is considered to be underweight and is associated with increased risk, BMI between 18.5 and 24.9 is considered normal weight and associated with least risk, whereas individuals with a BMI between 25-29 are considered overweight with increased risk of developing health problems. Obesity is defined as a BMI greater than 30, with obese class I in the range of 30-34.9 considered to be high risk, obese class II from 35-39.9 is considered very high risk, and obese class III are those with a BMI greater than 40 with an extremely high risk for developing health problems.

In Canada, the prevalence of obesity has been based mainly on self-reported surveys. However from 1978 to 1979, the Canada Health Survey measured height and weight on a sample of adults and determined the obesity rate to be 13.8% (Tjepkema, 2006). This was followed by the 1988-1992 Canadian Heart Health Survey that indicated the obesity rate to be 14.8%. More recently in the 2004 Canadian Community Health Survey (CCHS), height and weight were directly measured once again and the obesity rate was determined to be 23.1% (Tjepkema, 2006). This represents an increase of 167% and is considerably higher than self-reported data obtained in 2003, which indicated 15.2% of Canadians were obese, and is closer to US data based on measured values, where 29.7% of Americans were obese in 1999-2002 (Tjepkema, 2006).

The 2004 CCHS also found that 36% of Canadians were overweight with a BMI between 25-29. Combined with an obesity rate of 23% and an overweight rate of 36%, nearly 60% of Canadians are either overweight or obese (Tjepkema, 2006). This rising rate of obesity is alarming since any increase above normal weight increases the odds ratio (OR) of having heart disease. Normal weight individual have a 1.0 OR of developing high blood pressure and diabetes. The risk increase to an 1.5 OR in overweight to 5.4 OR of having high blood pressure for individuals with a BMI > 40 (Tjepkema, 2006).

It should be noted however, that even measured height and weight may underestimate obesity, since differences in body proportions and relationship between BMI and body fat content in different ethnic populations can affect the BMI range that is considered to be healthy. For example, for Asians, a healthy normal weight is considered to be a BMI between 18.5 and 23, whereas a BMI > 23 is considered overweight (WHO, 2004).

BMI also does not measure the distribution of body fat, or identify patients with abdominal obesity a key feature of the metabolic syndrome associated with hypertension, insulin resistance and dyslipidemia and increased cardiovascular disease morbidity and mortality (Lau, 2006). The Canadian Guidelines for Body Weight Classification in Adults (Health Canada, 2003) recommend measuring waist circumference as an indicator of obesity-related health risk. Men and women with waist circumferences over 102 cm

and 88 cm, respectively, are at increased risk of obesity-associated metabolic complications. Thus measuring waist circumference in addition to BMI increases the prediction of cardiovascular disease risk (Ardern, 2003). More recently the INTERHEART study indicated waist circumference was more strongly related to myocardial infarction risk than BMI, and amongst Chinese and black African people it was the strongest predictor of myocardial infarction (Yusuf, 2005).

2.1.2. 1. 4 Genetic factors / family history

The 2003 Canadian guidelines for dyslipidemia indicate a family history of cardiovascular disease increases risk as does ethnic background (Genest, 2003). Consideration of family history as a risk factor for cardiovascular disease should be part of the assessment of patients, since premature cardiovascular disease in a first degree relative doubles the risk of developing cardiovascular disease (Genest, 2003). In addition understanding the prevalence of genetic disorders in a population can impact intervention. For example, familial hypercholesterolemia in most Western populations has a prevalence of approximately 1/500, but in Quebec it is 1/233 (Genest, 2005). In Alberta, for example, Hutterites have increased prevalence of the promoter sequence variant 278A in the CYP7 gene, which in their population environment is associated with reduced plasma HDL cholesterol increasing their risk for heart disease (Hegele, 2001).

In addition to an individual's genetic factors, there are population effects of genetic influences on cardiovascular disease. The rapid transformation of the social environment, coupled with increased longevity has revealed a genetic susceptibility to a number of chronic diseases on a population level. The so-called 'thrifty gene' hypothesis is based on the survival benefits of more efficient energy storage, improved substrate supply and muscle performance during sustained exercise, and preparation for stress in a primitive world of deprivation and danger, but detrimental in an aging society of affluence (Benjamin, 2002; Riedel, 2005). For example in type 2 diabetic individuals, these thrifty genes have been found in higher levels than in the general population (Riedel, 2005). However, although genetic predisposition is considered a major risk

factor for development of disease, a significant contribution also comes from diet and lifestyle factors.

In regards to genetic influences on cardiovascular disease risk, there are substantial disparities in risk factors amongst various racial and ethnic groups. Based on a study of 1276 adults across Canada, the prevalence of metabolic syndrome was 41.6% in First Nations, 25.9% in South Asians, 22% in Europeans and 11% among Chinese Canadians (Anand, 2003). This is similar to other reports that the risk for cardiovascular disease of South Asians living in Western countries appears to be twice that of Caucasians even when matched for major risk factors (Grundy, 1999). The increased prevalence of developing cardiovascular disease in ethnic groups from low cardiovascular disease cultures who migrate to Western cultures, such as Japanese who move to the US, and adopt a lifestyle of reduced physical activity, increased fat and refined carbohydrate intake (Kagan, 1974), and develop a high incidence of cardiovascular disease within a generation illustrates the effect of the environment on genetic susceptibility.

Understanding disease etiology in terms of genetic determinants from both a family history and ethnic background perspective is useful in identifying individuals and groups at risk and adapting treatment management accordingly.

2.1.2.2 Behavioral factors

2.1.2.2.1 Smoking

The association between cigarette smoking and cardiovascular disease is well established. Since a study on smoking and coronary heart disease was published in 1940, numerous studies have reported smoking increases the risk of myocardial infarction, sudden cardiac death, stroke, peripheral vascular disease and aortic aneurysm, and increased morbidity and mortality in patients who already have cardiovascular disease (Waters, 1996).

The prevalence of smoking in Canada has decreased from 30% in 1985 to 18% in 2006 (Health Canada, 2006), however smoking remains the single most modifiable risk factor

for prevention of cardiovascular disease and still is responsible for approximately 1 in 4 of all cardiovascular disease deaths in Canada (Tanuseputro, 2003) and is reported to be the leading cause of mortality in the US (Mokdad, 2004). Rates of smoking also vary considerably by income level with the highest rates of smoking reported by men (40%) and women (36%) in the lowest income bracket.

2.1.2.2.2 Poor diet

Lipids and lipoproteins play a key role in modulating risk of CVD (Genest, 2003). Elevated levels of total cholesterol, LDL-C, and triglyceride (TG) increase CVD risk, while high HDL-C levels are beneficial. Blood cholesterol levels are adversely affected by dietary saturated fatty acids, *trans* fatty acids, and cholesterol, whereas unsaturated fatty acids and soluble fiber have favorable effects (Genest, 2003).

Ancel Keys using metabolic studies to investigate the effects on cholesterol level of different types of fat (butter, shortening, olive oil and corn oil) found that saturated fat was the main determinant of blood cholesterol levels (Keys, 1950). This was corroborated by the seven Country study which indicated cardiovascular death rates were related positively to saturated fat intake, and negatively to monounsaturated fat intake (Keys, 1984). Subsequent research has shown that individual saturated fatty acids do not all have the same cholesterolemic effect, myristic acid (14:0), of which dairy products are a rich source, has a strong serum cholesterol–raising effect, as do palmitic (16:0) and lauric (12:0) acids with stearic acid found in meat has less of an effect (Mensink, 2003). However trans fatty acids are more cholesterolemic than saturated fat because they not only raise LDL cholesterol levels but also lower HDL cholesterol levels. (Mensink, 1990). Reducing total fat intake to less than 30% and reducing saturated and trans fat to less than 7%, total cholesterol was reduced by 13% and LDL cholesterol was reduced by 16% (Yu-Poth, 1999). Many studies have shown heart health benefits of consuming fish and/or n-3 fatty acids supplements. In the GISSI Prevention Study (GISSI, 1999), individuals randomized to the EPA + DHA supplement group (850 mg/d of omega-3 fatty acid ethyl esters), with and without 300 mg/d of vitamin E experienced, a 15% reduction in the primary endpoint of death, nonfatal myocardial infarct, and nonfatal

stroke. In addition, all-cause mortality was reduced by 20% and sudden death by 45% compared with the control group. A meta-analysis of 67 clinical trials showed soluble fibres such as oats, psyllium, pectin and guar gum, led to an average LDL reduction of 5% (Brown, 1999).

Although shown in prospective cohort studies that antioxidants were associated with reduced rates of CVD, clinical studies have shown no benefits and supplements of Vitamin E (Miller, 2005) and B-carotene (Vivekananthan, 2003) can increase mortality. Likewise, although it has been recognized that high homocysteine levels are associated with greater rates of cardiovascular disease, and that folic acid and vitamins B6 and B12 lower homocysteine, giving folic acid and vitamin B6 and B12 did not reduce the risk of cardiovascular events (Lonn, 2006).

Overall, what remains consistent with diet interventions to reduce CVD is a total diet approach such as the Mediterranean type diet that is high in fruit and vegetables, whole grains, fish and reeducated saturated and trans fats (de Lorgeril, 1999). However data from the CCHS in 2000 indicated that 62.4% of Canadians consumed less than 5 servings of fresh fruits and vegetables per day, particularly in those with low income levels (Heart and Stroke Foundation, 2003).

2.1.2.2.3 Physical inactivity

Lack of physical activity increases the risk of cardiovascular disease two-fold, similar to hypertension, high cholesterol and smoking (Powell, 1987). Physical inactivity is defined as daily leisure-time energy expenditure of less than 1.5 kcal/kg/day, which for a 70 kg man would be expending less than 105 kilocalories per day (Heart and Stroke Foundation, 2003).

Data from the CCHS in 2000 indicated 56.5% of Canadians were physically inactive, and prevalence varied from the lowest physical activity levels in Atlantic Canada and those in lower socioeconomic status (SES) groups as compared with the highest levels of physical

activity in BC and Alberta and in those from higher SES groups (Heart and Stroke Foundation, 2003).

2.1.2.3 Psychosocial risk factors

The relationship between psychosocial risk factors and cardiovascular disease has been studied for some time. In the economic prosperity of the postwar era of the 1950s, the increasing rates of mortality from cardiovascular disease became apparent, especially amongst US businessmen, where it was thought stress was the driving force. Friedman and Rosenman described a Type A behavior pattern characterized by competitive behavior, pronounced impatience, and a potential for hostility, that was associated with high serum cholesterol and more clinical symptoms as compared with individuals with Type B behavior pattern, defined as the absence of Type A behavior (Friedman and Rosenman, 1959). This observation led to a prospective study, which indicated a Type A behavior pattern, predicted the development of cardiovascular disease independent of biomedical risk factors. However subsequent studies failed to show a relationship between Type A behavior and cardiovascular disease, and later research indicated the hostility component of the Type A behavior pattern has an effect on cardiovascular disease (Hemingway,1999; Pederson, 2003). Given the conflicting evidence regarding personality and stress, for many years there was reduced interest in conducting research on psychosocial risk factors for cardiovascular disease.

More recently there has been a renewed interest in the role of psychosocial risk factors for development of cardiovascular disease. European guidelines on cardiovascular disease prevention in clinical practice includes a comprehensive review of psychosocial factors (de Backer, 2003), and a recent review includes not only the epidemiology and pathophysiology of psychosocial factors, but also makes recommendations regarding behavioral and medical interventions for psychosocial risk factors in clinical cardiac practice (Rozanski, 2005). Consideration of psychosocial risk factors is important given the high prevalence in cardiac populations, psychological distress often presents as symptoms of cardiovascular disease, psychosocial risk factors affect treatment adherence

(e.g. depressed patients are three times more likely to be non-adherent) and acute psychological stress impacts the prognosis of cardiovascular disease (Rozanski, 2005).

2.1.2.3.1 Lack of social support

In the 1980s and early 1990s, considerable research was done on the relationship between social support and cardiovascular disease. Social support relates to both the extent of a person's social contacts and their quality, and is assessed by such factors as living alone, lacking a confidant, social isolation, and perceived low social support (Rozanski, 2005). Hemingway and Marmot's review of research (Hemingway, 1999) indicated 9 out of 10 prospective studies suggest a prognostic role for social support in patient populations with cardiovascular disease. The relative risk of developing cardiovascular disease due to lack of social support is reported as 1.3 to 5.4 (Hemingway, 1999) and there was an inverse gradient between the amount of social support and incidence of cardiovascular disease (Rozanski, 1999). Analysis of data from the 1998 to 1999 Canadian National Population Health Survey indicated lone mothers had significantly lower social support (51% reported having low social support) as compared with partnered mothers (31% reported having low social support) along with higher proportion of risk factors for cardiovascular disease such as increased smoking and depression and lower education and income levels (Young, 2004). This study is consistent with the relationship between living alone and social support as well as clustering of risk factors.

Recently Iribarren and colleagues (Iribarren, 2005) reported 16-year mortality data from the Coronary Artery Risk Development in Young Adults (CARDIA) study, that indicated in addition to race, sex, disease, and smoking, social factors such as low social support and high hostility were significant predictors of young adult mortality.

Practical behavioral interventions for addressing lack of social support includes providing specific suggestions such as joining a walking or weight loss group or engaging in socially altruistic activities (e.g. volunteering), or using staff as a support base and enrolling patients in a support group and facilitating family involvement (Rozanski, 2005).

2.1.2.3.2 Stress

Stress has been characterized as chronic or acute, such that occurs with outbursts of anger or following the death of a loved one or after catastrophic events such as earthquakes or war. In a study of 1623 post myocardial infarct patients, an episode of anger increased the relative risk of myocardial infarction more than 2 fold (Mittleman, 1995). In a study of 95,647 people followed for 5 years, mortality risk was highest in the month immediately after bereavement, with the relative risk (RR) higher in those with ischemic heart disease and higher in women with a RR of 3.5, as compared to men with a RR of 2.3 for all age groups (Kaprio, 1987). Chronic stress relates to social and environmental stress, work-related stress and stress at home such marital stress or caregiver stress. In regards to work-related stress, Marmot and colleagues in the landmark Whitehall prospective cohort studies of London civil servants, reported effects of a workplace social gradient in morbidity and mortality of cardiovascular disease mediated in part by high demand and low job control, as well as an imbalance between effort and rewards received (Hemingway and Marmot,1999). Suggestions for reducing stress include relaxation training (e.g. audiotapes, videotapes or instructional scripts), muscle relaxation, imagery, and biofeedback, as well as stress management and behavioral strategies such as problem-solving and coping skills (Rozanski, 2005).

2.1.2.3.3 Low self-esteem

Bandura (Bandura, 1997) defines self-esteem as a judgment of self-worth. People with limited competencies, exacting standards of self-evaluation and socially disparaged attributes are more likely to have low self-esteem and a pervasive sense of worthlessness. The concept of self-esteem is often used interchangeably with self-efficacy, however self-efficacy is more concerned with judgment of personal capability, and situational specific self-confidence. Self-efficacy belief is a strong predictor of an individual's ability to adopt and maintain health-promoting behaviors. Strategies to improve self-efficacy include developing self-regulatory skills such as self-monitoring, goal setting and incentives for personal change, coping strategies to manage emotional states, and developing approaches to relapse prevention (Bandura, 1997).

Depression is linked to self-esteem and self-efficacy, since as Bandura indicates "a low sense of efficacy to gain the things in life that bring self satisfaction and self-worth breeds depression, and depression, in turn, diminishes belief in one's personal efficacy." (Bandura, 1997, pg. 113). Depression is being increasingly recognized as a risk factor for developing cardiovascular disease and is also associated with increased morbidity and mortality in patients with established coronary artery disease and is associated with low adherence to behavior change recommendations (Carney, 2002; de Backer, 2003). In addition, treatment with antipsychotic medication is associated with a significant increase in risk of hyperlipidemia (Olfson, 2006). It is estimated 10% of Canadians are at risk of depression (Statistics Canada, 2002). In contrast 20% of patients newly diagnosed with coronary artery disease were found to have major depression and a further 20% of patients were diagnosed with minor depressive symptoms (Carney, 2002).

Given the strong association between depression and cardiovascular disease, Hemingway and Marmot (Hemingway, 1999) recommend clinicians should screen and treat depression. Strategies to improve minor depressive symptoms include counseling to change faulty habits of thinking from a pessimistic attribution style to a self-enhancing style where successes are credited to an individual's personal characteristics and failure to external factors, and to improved self-evaluation (Bandura, 1997). There can also be reduction in depressive symptoms with increased exercise (Rozanski, 2005). However, individuals with significant clinical depression should be referred to specialists for counseling and/or psychiatric treatment (Rozanski, 2005).

2.1.2.3.4 Low socio-economic status

Socioeconomic status (SES), which includes education, occupation and income, exhibits an inverse relationship with cardiovascular disease mortality. In Alberta, the percentage of individuals on low income ranges from 9.5% in urban centers to 12.8% in northern rural centers and is associated with clustering of other risk factors. Although low SES is accompanied by poor health habits and higher frequency of risk factors, these account for

less than half of the SES-cardiovascular disease relationship (Marmot, 1997). Increased financial hardship, poorer housing conditions, and increased levels of chronic stress also characterize low SES, as does poor working conditions, less job control and lower self-esteem (Marmot, 1997). Low SES can be viewed as a composite psychosocial stressor, and preventive efforts need to focus on individuals with low education in lower job positions, and at a population level the focus needs to be changed from physiological and behavioral risk factors to address the social and financial barriers to improvements in cardiovascular disease (Raphael, 2001).

2.1.2.4 Environmental risk conditions

2.1.2.4.1 Poverty

Poverty is linked to health, in that income provides the prerequisites for health (e.g. shelter, food, and ability to participate in society). Low income can limit choices and cause stress and anxiety, which adversely impact health (Benzeval, 1995). As reviewed by Williamson (Williamson, 2006), people living with low incomes are less healthy, have more medical conditions and require more health services than those with higher incomes. In Canada in 2004, 13% of Canadian children, 8% of two-parent families, and 40% of female lone-parent families live in poverty (Statistics Canada, 2004).

Strategies the health sector can undertake to address poverty include raising awareness about poverty and its negative health effects, work with other organizations to target individuals and families at risk of poverty (e.g. food banks, school lunch/snack programs), lobby other government sectors to increase minimum wage, eliminate school fees, provide safe and affordable housing (Williamson, 2001), and ensure provision of comprehensive health benefits to all those with low incomes (Williamson, 2006). The impact of policy on poverty related health concerns is significant. For example, a study of food insecurity of low-income lone mothers and their children in Atlantic Canada, indicated significant differences in prevalence of food insecurity existed among provinces that was related to differences in provincial policies (McIntryre, 2002).

2.1.2.4.2 Poor work conditions

In addition to the psychosocial aspects of work on health, hours of work and types of work can influence health. Comparison of shiftworkers and dayworkers at pulp and paper manufacturing plants, indicated significant increased mortality from cardiovascular disease among shiftworkers with a long duration of working shiftwork (Karlsson, 2005). Strategies the health sector can undertake to address work conditions include, being a role model as an employer of choice and participating in inter-organizational initiatives such as promoting respect in the workplace (Laschinger, 2005). There can also be improvements in health and safety related behavior in the community by partnering with employers who emphasize occupational health and safety as done with oil sands workers in Fort McMurray, Alberta, the Northern Lights regional health authority (Guidotti, 1996). Barbeau and colleagues (Barbeau, 2005) recommended using trade unions as a channel for health promotion interventions given the increased risk factors among working class employees. Reynolds (Reynolds, 1997) indicated interventions such as stress management and counseling to help individual employees manage difficult working conditions can be effective.

2.1.2.4.3 Discrimination

Discrimination is showing favoritism or prejudice based on gender, age, or race for example. Recent research indicates significant disparities in health care of individuals with cardiovascular disease based on gender (Roger, 2003), age (Elder, 2005), and ethnic background (Redberg, 2005). Strategies to address the effects of discrimination on health include raising awareness among stakeholders, improving cultural and gender competency in the health sector and tailoring programs to meet gender, cultural and linguistic needs, as well as recognizing the influences of the wider socioeconomic environment and more community based public health approaches (Exworthy, 2006). Collecting health care data by race, ethnicity, and disparity indicators at the local health care level are also important to inform and guide program development, implementation, and evaluation (Mensah, 2005). For example, program evaluation from a gender perspective may reveal that women cannot participate in recreational exercise due to

barriers such as lack of child care or transportation (Colman, 2000) or that less women participate in cardiac rehabilitation programs than men despite a greater CVD risk factor burden than men (Thomas, 1996).

2.1.2.4.4 Income and neighborhood inequality

Income inequality is the gap between the wealthiest and the poorest within a community, region or province. Income inequality has been shown to independently predict mortality (Idler, 1997) in countries such as the US and UK where income inequality is greater than found in Canada (Ross, 2005). The lack of association of income inequality with health in Canada is thought to be the low magnitude of inequality, impact of social policies and unemployment rate (Xi, 2005).

In studying the effects of income on health, self-reported income levels or aggregate measures available from census data which includes the average income levels across geographic units such as postal codes, or election enumeration areas are used. Xi and colleagues (Xi, 2005) found that aggregating data by public health unit, income inequality was significantly associated with self-reported health status. When geographic units are used, the median income level reflects neighborhood income. Southern and colleagues (Southern, 2005) found in a follow-up of a cohort of Alberta patients after cardiac catheterization, low-income individuals living in low-income neighborhoods had the worst outcomes in terms of reduced survival and health-related quality of life. However, low-income individuals had improved outcomes when living in neighborhoods with higher incomes (Southern, 2005). These findings are consistent with research in the US, which found a three-fold increase of heart disease for those living in disadvantaged neighborhoods regardless of income, education and occupation and lifestyle risk factors (Diex Roux, 2001), and in Canada a positive effect of neighborhood socio-economic status (income and education) on individual health (Hou, 2005).

Strategies to address the effects of neighborhoods on health status, include combining individual-centered approaches with approaches aimed at improving the quality of residential environments. For example, upon finding price inequities in grocery stores located in low-income neighborhoods, members of a community drop-in Parent Center

confronted the supermarkets with their findings, which resulted in stores changing buying practices to decrease price inequities between locations (Travers, 1997). Advocacy by the health sector to improve environmental risk conditions is needed since placing responsibility on those with the fewest resources and political power to initiate change is unlikely to be effective (Travers, 1997).

2.1.2.4.5 Summary

Risk factors for cardiovascular disease include physiological, behavioral, psychosocial and environmental. Risk factors not only increase the risk of cardiovascular disease, but also the levels of other risk factors. For example, overweight and obesity increase the risk of cardiovascular disease by influencing blood pressure, dyslipidemia and insulin resistance. A multifactorial approach considering not only individuals but also populations is needed to reduce cardiovascular disease.

2.1.3 Nutrition and Heart Health Promotion – a population perspective

It has long been recognized that health involves more than just treatment of disease. The widely accepted definition of health is from the WHO that indicates: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948).

In Canada, there has been increased awareness of the importance of health promotion, since the publication in 1974 of a report entitled *A new perspective on the health of Canadians* (Lalonde, 1974). The report indicated the health care system, is only one of many ways of maintaining and improving health, and called for further improvements in the environment, personal behaviors (lifestyles), and a greater knowledge of human biology. It also included a new perspective that health field categories of environment, personal behaviors and human biology need to be raised to an importance equal to that of health care organizations. Also in 1974, an editorial in The Lancet identified obesity as "the most important nutritional disease in the affluent countries of the world" (Anon, 1974), which only a quarter of a century later has become a global epidemic of obesity.

The First International Conference on Health Promotion was held in Ottawa, Canada in 1986, with the production of the *Ottawa Charter for Health Promotion* (WHO, 1986). The Ottawa Charter for Health Promotion has set the direction for development of health promotion strategies by many countries and organizations around the world. It indicates the pre-requisites for health are peace, economic resources, food and shelter and a stable eco-system, and highlights the links between social and economic conditions, the physical environment, individual lifestyles and health. Health promotion was defined as "the process of enabling people to increase control over and to improve their health." (WHO, 1986), and five priority action areas for health promotion include developing personal skills, re-orienting health services, creating supportive environments, strengthening community action, and building healthy public policy were recommended.

2.1.3.1 Developing personal skills

Developing personal skills of individuals through providing information and enhancing life skills increases options available for people to have more control over their health.

2.1.3.1.1 Developing personal skills of individuals at high risk

There is evidence to support the effectiveness of intervention programs for preventing disease progression and improving the health of individuals with a high risk of disease. In a diabetes prevention study of 500 people with impaired glucose tolerance in Finland, compared with a control group there was a greater level of weight loss, reduced total fat and saturated fat, increased fibre and increased physical activity in an intervention group resulting in a 43% reduction in relative risk (Lindstrom, 2006). In another study, 3234 participants with impaired glucose tolerance were randomized to either a low fat diet (25% of energy) diet and exercise (150 minutes/week), metformin or a control group. After three years, the diet and exercise group reduced their risk of developing diabetes by 58%. About 29% of the control group developed diabetes, compared with 22% of the metformin group, and 14% from the diet and exercise group (Diabetes Prevention Program Research Group, 2002). Taken together, it is clearly beneficial to encourage high-risk patients to make lifestyle changes.

Since physicians have contact with approximately 80% of all adults each year (Statistics Canada, 1997) they represent a readily available resource for health promotion and disease prevention. However, only half of physicians routinely advise people who smoke to quit, and only a third of patients who need treatment for high blood cholesterol actually receive it (McClaren, 2001). In a study of 603 patients from 45 physician practices, 33% of patients with cardiovascular disease were not screened with lipid panels, 45% were not receiving dietary counseling, and 67% were not receiving cholesterol medication in accordance with the National Cholesterol Education Program guidelines in the 2 years after their release (McBride, 1998).

Reasons frequently cited for not delivering health promotion and disease prevention oriented care is lack of training or skills to provide counseling, and a lack of confidence

in skills. Curran (Curran, 2002) reports that 85% of physicians found lack of patients' compliance with lifestyle advice the most frequent issue they encounter, and the most common solution suggested to problems in management of cardiovascular disease was public/patient education programs.

In addition, performing dramatic clinical interventions and procedures such as heart transplants receive public attention and may be seen to be more valuable and rewarding from a clinician's perspective, however take place at a very late point in the patient's clinical course, a point that might have been averted by greater attention to risk-factor modification (Chiriboga, 2003). Nestle (2000) recommends health care providers be required to learn about behavioral risks for obesity and incentives be provided to health care providers for nutrition and obesity counseling. Caution is warranted, since emphasis on 'unhealthy' behaviors without considering the socio-economic context of individuals may deter patients from seeking medical care and foster victim blaming (Richards, 2003).

Furthermore a deficiency of the high-risk approach, as Rose (1992) has pointed out, is that a high risk approch only affects a minority of future cases, the 15% of men at high risk of CHD account for only 32% of future cases. Therefore, to achieve a major effect on CHD it is necessary to target the entire population.

2.1.3.1.2 Population approach to developing personal skills

During the 1970s the connection between lifestyle and health became increasingly apparent. As a result many people assumed that the next step was to disseminate this information to the public and by exhorting lifestyle changes through health education would bring about the necessary changes. However, reviews of the effectiveness of using the mass media shows little evidence of behavior change as a result of education alone (Cavill, 2004; Beaudoin, 2007). Most of the health promotion campaigns that occurred in the 1980s and 1990s focused on individual risk factors for cardiovascular disease.

A number of community interventions have used mass media combined with various other methods to reach the target population. Three major projects were carried out in the

US during the 1980s. Their aims were to lower elevated levels of blood cholesterol, blood pressure, and weight, to cut smoking rates, and to persuade more people to exercise. Each program lasted five to eight years and succeeded in implementing its intervention on a broad scale, involving a large number of programs and participants. In the Stanford Five-City Project in California, two intervention cities received health education through media, direct education, and schools (Farquhar, 1990). A similar project was the Minnesota Heart Health Program, which included three intervention cities and three control cities in the Upper Midwest in the US (Luepker, 1994). A third project was the Pawtucket Heart Health Program in which the population of Pawtucket, Rhode Island, received intensive education at the grass roots level: schools, local government, community organizations, supermarkets, but without involving the media (Carleton, 1995).

An analysis combined the results of the above three studies so as to increase the sample size to 12 cities (Winkleby, 1997). Improvements in blood pressure, blood cholesterol, BMI, and smoking were of very low magnitude and were not statistically significant; the estimated risk of CHD mortality was unchanged. These results are consistent with the results of a meta-analysis of 17 randomized controlled intervention trials where dietary advice was given to healthy adults (Brunner, 1997). Changes over 9 to 18 months included decreases in serum cholesterol and blood pressure, leading to a modest reduction of 14% in the estimated risk of CHD. One factor contributing to the lack of effect may have been secular trends, since the projects took place at a time when lifestyles were becoming generally healthier and CHD rates were decreasing.

Thus exhortations to the individual, whether via the media, in the community, at the worksite, or in the physician's office, might be expected to reduce the risk of CHD by about 5 to 15%. Indeed, the healthy policy recommendations which have focused solely on individual recommendations such as "To avoid overweight, consume only as much energy as is expended, if overweight decrease energy intake and increase energy expenditure," without addressing factors in society and the environment, are unlikely to impact on the rising prevalence of obesity (Nestle, 2000).

However interventions aimed at encouraging people to improve their lifestyle should not be dismissed. Since minor changes can make valuable contributions to public health that more than justify the expense and effort involved. As listed in Table 2.1, examples of strategies to develop personal skills would be to advocate for mass media health promotion campaigns that emphasize healthy eating and lifestyle choices (Nestle, 2000), provide nutrition intervention programs with ongoing training and support instead of single intensive sessions (Sahay, 2006), use a multimodal approach to dietary modification including telephone counseling, group lectures, and cooking classes (Newman, 2005; Cavallaro, 2004; Levy, 2004), encourage individuals to self-monitor and assist with goal-setting (Siegert, 2004), improve individuals stress management through developing problem-solving and coping skills (Brownell, 1995), and develop support groups and facilitate family involvement in dietary change (Sahay, 2006).

Sahay and colleagues (Sahay, 2006) in a review of the literature regarding successful population approaches to dietary intervention concluded the wider into the environment (i.e. such as schools and worksites) the interventions reached, the more activities for all stages of change, and the provision of nutrition intervention programs with ongoing training and support instead of single intensive sessions, were all associated with greater behavior change. These conclusions support the importance of the "preventive dose" in health promotion in delivering the right health promotion strategy, in the right amount, and reaching the right number of people (Raine, 2002).

2.1.3.2 Re-orienting health services

The role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services. This mandate should support the needs of individual and communities for a healthier life, and open channels between the health sector and broader social, political, economic and physical environmental components.

The need for prevention and health promotion for sustainability of health care system is recognized since the cost of health care is 8.7% (6 % public, 2.7% private) of GDP per year (Conference Board of Canada, 2001), whereas economic growth as measured by the increase in GDP reported between 1997 and 2004 is 2.9 % per year (Canadian Industry Statistics, 2006). Healthcare delivery has been moving towards regional health systems that integrate hospitals, home care and public health services. The impetus for change has been to reduce costs and improve the efficiency of health care service delivery. Although regionalization with allocating resources from the province to the region and integration of service was supposed to have improved the alignment between population health needs and allocation of health care resources, the role of health promotion remains secondary to hospital and biomedical perspectives. For example, many dietitian resources are focused in the hospitals vs. the community, and those working in outpatient programs focus more on disease rehabilitation than prevention with the requirement that in order to counsel patients for weight loss they must have an underlying disease such as diabetes or cardiovascular disease (Raine, 2004). In contrast, Raine (2004) recommends weight management should be included as an insured service for Canada's health system and/or for supplementary health insurance plans.

In addition, the concern and attention to access to acute health services and waiting lists for surgery is not matched by equal levels of concern and attention towards determinants of health including employment and environmental factors. This lack of re-orienting health services has been in part due to the challenge of allocating resources within a region, lack of information on regional needs, providers having considerable market power, and funding decisions based on historical practice and previous budgets (Hurley, 2004).

Barr and colleagues (Barr, 2003) recommend expanding on the concept of re-orienting health services to including decision support and information systems for gathering evidence on strategies for health promotion, and to combine information on demographics, social and economic trends with needs and strengths of the community. Raine (2002) recommends that instead of competing with acute health services for

funding, that a dedicated wellness fund be established so the investment in the sustainability of health care can be made. Nestle (Nestle, 2000) makes a similar recommendation of diverting funds from taxation of soft drinks and other foods high in calories, fat or sugar to fund promotion of good nutrition and physical activity.

2.1.3.3 Create supportive environments

With the increasing prevalence of obesity, it is evident obesity is not primarily a medical problem but rather is a social problem influenced by environmental factors. Recent reviews have started to focus on 'obesogenic environments' which promote excessive food consumption and discourage physical activity (Raine, 2004). Changes in the environment such as increased labour-saving devices, increased use of automobiles, availability of television and computer games, decline in physical activity at work and school, increased food serving sizes and increased availability of high calorie snack foods and fast food, more concern about personal security resulting in home-based activities, have all produced changes in behaviour. This section examines the association between overweight and obesity and lifestyle and social environmental and physical environmental factors.

2.1.3.3.1 Social environment

The denormalization or demarketing of the tobacco industry is the reversal of tobacco being recognized as a legitimate, normal product. Denormalization of tobacco use is the process used to show that tobacco products are not normal, acceptable products in the marketplace, and involves changing social norms. In Alberta, with mass media campaigns, legislation banning smoking in public places and restricting tobacco product placement, promotion and sales, there is lessened public support for smoking, with 91% of Albertans agreeing tobacco is a dangerous, cancer-causing substance, and 88% of Albertans agree smoking should be banned in places were children are present (AADAC, 2004).

Like smoking we need to create new social norms for healthy eating and active living. Advertising and marketing methods have changed society, making it too easy to overeat, and it is now socially acceptable to eat anywhere, all day, every day in large and larger quantities. A review of portion sizes of foods revealed on average soft drinks are 35%, fast-food hamburger 112%, bagels 195%, steak 224%, and cookies 700% larger than the USDA portions for dietary guidance (Young, 2002). Thus when researchers are analyzing consumer's reports of portion sizes in the assessment of food intake, underreporting of intakes is not only with the respondent but also with the researcher (Raine, 2004). Evidence also suggests that the availability of larger portions increases consumption (Rolls, 2002) contributing to the obesity epidemic. In contrast, the social norms are different in France, portion sizes are smaller, and the French spend more time eating, resulting in a longer food experience while eating less, and reduced incidence of obesity (Rozin, 2003). Overall, there needs to be shift in the social norms of eating in North America with less focus on quantity of food consumed.

Foods that are heavily advertised are reported to be over-consumed relative to recommendations, while foods that are advertised less frequently are under-consumed. In 1997, US food manufacturers spent $11 billion in mass-media advertising. This included $765 million on candies and snacks, $571 million on McDonald's, $549 million on soft drinks and only $105 million on fruits and vegetables. In contrast, the nutrition education budget was 3% of food industry expenditures (French, 2001).

A particular issue is food advertising on children's programs. The marketing and availability of high-energy snack foods and soft drinks continue to increase. A study of advertisements appearing on Saturday morning found that 44% were for fats, oils, and sugar, 23% were for highly-sugared cereals, 11% for fast-food restaurants, and none were for fruit and vegetables (Kotz, 1994). Television advertising that emphasizes high energy and fat rich foods, results in children having an increased preference and demand for these items (Borzekowski and Robinson, 2001).

2.1.3.3.2 School environment

As children spend a significant amount of their time at school, schools present an environmental opportunity for promoting healthy eating among children and adolescents. Developing approved menus for school meals and student stores, guidelines for bag lunches and healthier food choices for fundraising, increases consumption of healthy food (Booth, 2001). In Canada, some efforts to move towards school food policies have been embraced by students, staff and parents (Steffenhagen, 2003), whereas others have been reversed due to a need to generate revenue (Steffenhagen, 2003b).

Of particular note is the growing political movement against soft drinks in schools (Fried and Nestle, 2002). Research has shown availability of soft drinks displaces healthier beverage choices such as water, low-fat milk and 100% fruit juice (Harnack, 1999), and youth who consume more soft drinks are more overweight (Ludwig, 2001). In the US the American Academy of Pediatrics has issued a policy statement on restriction of sales of soft drinks in schools (American Academy of Pediatrics, 2004). The Los Angeles school district, which has $4.5 million in soda sales per year in their 677 schools, voted to ban all soft drinks beginning in 2004, requiring additional support from the state department of education in the forms of grants to assist with the transition (LA school district, 2002). In Canada, large beverage manufacturers withdrew soft drinks from vending machines in elementary schools, a move which some have indicated is more of a public relations motive since vending machines are predominantly located in high schools, not elementary schools. In addition, sale of bottled water, sports drinks and juices are still permitted in schools in both Canada and the US, and thus although consumption of soft drinks may decrease, consumption of other sweetened products (i.e. beverages high in sugar and calories such as fruit drinks and ice tea) or candy bars, or may not improve health or reduce obesity (Finkelstein, 2004).

2.1.3.3.3 Worksite health promotion

While children spend a great percentage of their time at school, adults spend a significant amount of time at work. Environmental interventions to promote healthy eating and physical activity have focused on the worksite. A pioneering project of this type, which

started in 1976, was carried out in Europe by the World Health Organization. The project was conducted over six years in 80 factories in Belgium, Italy, Poland, and the UK with the aim of preventing cardiovascular disease (WHO, 1986). The trial achieved modest risk factor reductions (1.2% for plasma cholesterol, 9% for smoking, 2% for systolic blood pressure, and 0.4% for weight); but was associated with a 10% reduction in cardiovascular disease.

At around the same time Live for Life was carried out by the Johnson & Johnson Company in the US. This comprehensive intervention was started in 1979 and lasted two years. Employees exposed to the program showed significant improvements in smoking behavior, weight, aerobic capacity, incidence of hypertension, days of sickness, and health care expenses (Breslow, 1990). This program was relaunched in 1995 with a focus on providing preventive services, health education and training along with health risk assessments. To encourage participation, an incentive of $500 US was provided for employees who took part in various aspects of the program. The results of the program evaluation indicated an average savings of $898 per employee for the four years of the program, with most of the savings occurring in the third and fourth years after program implementation (Ozminkowski, 2002), indicating a positive return on investment over time with worksite health promotion.

Another worksite project took place in New England (Sorensen, 1992). Employees were encouraged to increase their intake of fiber and to reduce their fat intake. Compared with the control sites, the program had no effect on fiber intake but fat intake fell by about 3%. A few years later the research team reported that they succeeded in increasing employees' intake of fruit and vegetables by 19% (half a serving per day) using an approach that targeted employees and their families (Sorensen, 1999). A similar project in Minnesota at 32 work sites offered employees weight control and smoking cessation programs (Jeffery, 1993). The program had no effect on weight but the prevalence of smoking was reduced by 2% and the amount of sick time decreased by 4.5% more than occurred in the control worksites, representing a significant saving in sick time replacement costs for the employer (Golaszewski, 2001). An explanation for the modest

findings of worksite intervention on behavior change is the self-selection by employees, diffusion of information from intervention to control group, confounding factors in non controlled environments, the short duration of evaluation (Anderson, 2001), as well as the lack of the preventive dose with a strong enough intervention for a sustained period of time to have an effect (Raine, 2002).

However, worksite health promotion programs and initiatives to address hazards in the physical work environment through Occupation Health and Safety standards and enforcement, are not enough to create healthy work environments, since the work environment itself has a powerful effect on workers' health. One of the landmark studies was conducted in the British civil service. The Whitehall Study, a prospective cohort study found that workers who had little control within their jobs were over 50 per cent more likely to suffer from heart disease. As well a lack of control was more strongly related to increased risk of heart disease than to individual lifestyle choices such as low physical activity and smoking (Marmot, 1999). In work settings with high effort and low reward, the risk of developing new cardiovascular problems, was 1.8 times greater than when high levels of effort were met with high levels of reward (Bosma, 1998).

2.1.3.3.4 Physical environments

The connection between physical environments and public health became increasingly apparent during the industrialization of the 19th century, with increased infectious disease and epidemics associated with unsanitary crowded living conditions in close proximity to industrial facilities (Rosen, 1993). In the early 20th century, zoning laws separated residential areas from business and industry, with a focus on population deconcentration to improve public health. Today, more than half of North Americans live in suburban rather than urban settings, with the spread-out design of suburbs increasing the reliance on automobiles. Since housing, jobs and retail are far apart, longer commuting time is required and less time is available for health promoting activities including exercise and preparation of healthy foods. Compact, mixed-use development where pedestrian access is encouraged and available will help promote healthy populations (Perdue, 2003).

In addition to industrialized nations, the impact of the physical environment on health is also evident in developing countries. Currently, 60% of cardiovascular disease occurs in developing countries, and by the year 2020 this is expected to increase to 80% with increasing urbanization and associated decrease in physical activity level (reduced occupational energy expenditure), increased energy and fat consumption, resulting in increased weight (Yusuf, 2001).

As well as limitations of the physical environment on health promotion activities, environments have also become unhealthy with limited access to nutritious food. There is an increased density of fast food restaurants in inner cities, with a lack of access to supermarkets (Travers, 1996), and reduced ability to access fruits and vegetables (Morland, 2002). Even when grocery stores are located in lower income areas, Horowitz and colleagues (Horowitz, 2004) reported that only 18% of grocery stores in a lower income area stocked healthy foods as compared with 58% of grocery stores in a more affluent neighborhood. Instead of focusing solely on exhorting individuals to increase consumption of fruit and vegetables, food needs to be considered at the broader environmental level.

2.1.3.4 Strengthen community action

There are some examples of reasonably successful community projects for heart disease prevention. One of the earliest and most informative such projects was conducted in North Karelia, a region of eastern Finland with an exceptionally high rate of CVD (Puska, 1995). The intervention began in 1972 before much health information had reached the population. A comprehensive nutrition policy to change the traditional Finnish diet rich in fatty dairy products and poor in vegetables and fruit was developed. In addition to health education, shifting the priorities in the subsidies of agricultural products and negotiating changes in the dietary practices of the catering services in the schools and workplaces were used to reduce consumption of high fat dairy products. A key part of the success of the North Karelia project was developing policies outside the

health sector to promote health. Over the next few years CHD rates in North Karelia fell sharply in comparison to other regions in Finland (Puska, 1995).

Two more recent community campaigns are of particular interest because each was narrowly focused on changing only one aspect of lifestyle and used paid advertising as a major intervention strategy. The 1% Or Less campaign aimed to persuade the population of two cities in West Virginia to switch from whole milk to low-fat milk (1% or less) (Reger, 1998). Advertising in the media was a major component of the intervention (at a cost of slightly less than a dollar per person) together with supermarket campaigns (taste tests and display signs), education in schools, as well as other community education activities. Low-fat milk sales, as a proportion of total milk sales, increased from 18% to 41% within just a few weeks. An Australian intervention campaign also used paid advertising as a major component to increase consumption of fruit and vegetables (Dixon, 1998). A significant increase in consumption of these foods was reported (fruit by 11% and vegetables by 17%).

As outlined in Table 2.1, strategies to strengthen community action include: develop collective kitchens and community gardens to promote access to affordable nutritious food, work with transportation departments to ensure public transport is available between low income areas and food shopping centers, work with grocery stores for home delivery of groceries for homebound individuals, and work with local media and price-watch group in regular monitoring and publishing prices of healthy food choices (Webb, 2001), and provide small grants to community organizations to make changes in the environment that support better nutrition (Johnson, 2007). Working with community organizations is an important link between health promotion interventions and population level outcomes. Factorial analysis of survey results from 429 employees in public health, indicated there are four factors needed by health departments to engage in community based public health: 1) agency's and 2) the individual employee's skills in working with community groups and populations, 3) extent and frequency of agency networking, and 4) community participation in health department planning (Parker, 2003). Similar results were reported by Proenca and colleagues (Proenca, 2003) in that factors associated with

provision of health promotion by a sample of 3,453 US hospitals was the extent of networks, diffusion of services among other hospitals and the use of community health status information to guide interventions.

2.1.3.5 Build healthy public policy

Healthy public policy is characterized by an explicit concern for health and equity in all areas of policy, and by accountability for health impact. The main aim of healthy public policy is to create a supportive environment to make the healthy choice the easy choice. It makes social and physical environments health enhancing. The Ottawa Charter for Health Promotion (WHO, 1986) emphasized health promotion action goes beyond the health care sector, pointing out health should be on the agenda in all sectors, and at all levels of government. An example of healthy public policy is implementation of comprehensive smoke-free bylaw policies with a reduction in smoking, and the subsequent improvement in health. Research has indicated that the number of acute myocardial infarctions in a region declined by 60% since implementation of anti-smoking legislation (Sargent, 2004).

Policies for promotion of healthy eating include food based dietary guidelines that are the expression of the principles of nutrition education through foods. Dietary Guidelines exert policy influence through two mechanisms: 1) their effects on information policy, such as federal nutrition education and food labeling efforts; and 2) their effects on regulations governing federal nutrition programs. Improved nutrition labeling on most prepackaged foods; science-based health claims and defined nutrient-content claims can help consumers make informed choices about the foods they buy and eat. However further improvements in food labels have been suggested. The Report of the Joint WHO/FAO Expert Consultation on Diet, Nutrition and Prevention of Chronic Diseases published in 2003 (WHO, 2003), recognized that there are several foods and ingredients (such as fruits, vegetables, whole grain cereals, legumes, fish, fish oils, nuts, red meat, salt, sugar) for which there is convincing evidence or probable evidence of protective or causative effects on risks for chronic diseases. Having mandatory percentage ingredient

disclosure requirements on multi-ingredient food products is important since the amount of ingredients cannot always be determined by reading the nutrition information panel. For example, current nutrition labeling does not permit consumers to compare the whole grain content of various breads or crackers, the amount of vegetables in different vegetarian lasagnas or the amount of added sugars in applesauce. As noted in the WHO report, it is the foods themselves, not the presence of specific nutrients in the foods, which may create the beneficial or detrimental effect on health (WHO, 2003).

2.1.3.5.1 Effect of price on sales

Prominent among available government powers are legislation and the use of taxation and subsidies. There is convincing evidence that price increases are an effective means to reduce smoking (Meier, 1997). It has been estimated that a 10% increase in price reduces tobacco consumption by about 5%, especially among the lower socioeconomic groups (Townsend, 1996). The prevalence of smoking in young Canadians fell by half during the 1980s in tandem with a doubling of the price. This trend was reversed in the early 1990s when the price was slashed in an attempt to reduce smuggling from the US (Stephens, 1997). In 2002 in Alberta, the tobacco tax was significantly increased along with introduction of anti-smuggling measures resulting in a 24% decrease in sales volume of cigarettes, and reduction in smoking rate from 25% in 2001 to 23% in 2002, with the largest reduction among young smokers (AADAC, 2004). Price increases have a greater impact on tobacco reduction than education or media campaigns. Alcohol intake is similarly affected by price. A price rise of 10% causes a decrease in consumption by 3 to 8% (Anderson, 1994). Studies in Eastern Europe, especially Poland and the former USSR, have demonstrated that pricing along with rationing reduces consumption and mortality (Zatonski, 1998).

What applies to cigarettes and alcohol could also applies to food. It has been suggested strategies to increase nutrition awareness and continuing to recommend healthy diets higher in fruits and vegetables that are costly to low income families can only increase frustration and victim blaming among the poor (Drewnowski, 2004). Subsidization of healthy food choices may be a better strategy than taxing unhealthy food. As Finkelstein

(Finkelstein, 2004) points out, a relatively small tax does not significantly affect consumption, whereas a large tax would affect consumption but increase food insecurity among low income consumers. Furthermore, comparison of nutrition message and price reduction strategies suggests that price decreases are a more powerful means to increase consumption of healthy foods than health messages (Horgen, 2002).

Reducing prices on low-fat snacks has been shown to be effective promoting lower-fat snack purchases from vending machines (French, 2001). Another study showed reducing the price of fresh fruits and vegetables effectively increased sales of the targeted items by four-fold and two-fold, respectively, among high school students over a three week period (French, 2003). A country effect price of healthy food can be seen in Poland (a former socialist economy) in recent years. In the early 1990s the ascending high rates of CVD in Poland decreased by a third. This occurred with reduction in smoking, reduced intake of butter and eggs (with removal of subsidies), and increased fruits and vegetables, due to reduction in cost of fruits and vegetables associated with a free market economy (Szostak, 2003).

As the Ottawa Charter for Health Promotion (WHO, 1986) indicates, in order to build healthy public policy, health needs to be on the agenda of policy makers in all sectors and at all levels, directing them to be aware of the health consequences of their decisions and to accept their responsibilities for health. A common barrier to building healthy public policy is the gap between the health agenda and the priorities of other departments (Lavis, 2001). In order to move health policy across sectors, information about the health consequences of other departments' decisions need to be framed in the language of the other departments, and benefits beyond health such as the economic and societal costs of obesity and poor nutrition, need to be articulated.

Other strategies, as outlined in Table 2.1 for building healthy public policy include: requiring restaurants, television and print advertisements to provide calorie information on menus and advertisements (Nestle and Jacobsen, 2000), develop school food policies, support tax policy that promotes social equity to address low SES as a determinant of

health, and develop policy guidelines for neighborhood food access in low income areas (Webb, 2001).

Glasgow and colleagues (Glasgow, 2003) argue that one reason for a gap between research documenting successful health promotion and consistent application in practice is the factors associated with success in intensive and highly standardized research are sometimes quite different than programs that succeed in population settings. Unlike standard medical intervention such as medications or surgery, behavioral interventions are more difficult to define and standardize, especially when delivered by staff with limited training and expertise in behavioral intervention (Glasgow, 2003). The influence of social context factors such as socioeconomic status, and type of setting need to be considered earlier in research and purposeful or over-sampling strategies can be used to include specific groups (e.g. less educated), before application of the intervention at a broader population level (Glasgow, 2003).

There has been increased recognition that focusing on individual behavior change is not enough to improve the public's healthy eating patterns. Communicating healthy eating messages and developing personal skills of individuals to make healthy lifestyle choices are just the first steps. What is needed is a re-orientation of health services to focus on health promotion and disease prevention, creating environments supportive of healthy eating in schools, workplaces and communities, and working in collaboration with community organizations to ensure public policies are developed at the local and national levels in all areas of government that support healthy food choices. Taking action on specific issues utilizing strategies outlined in Table 2.1 is suggested to be important in improving the nutritional health of a population.

Table 2.1. Strategies to Promote Healthy Eating – a population health perspective

Priority Action Areas	Environmental Setting	Examples of strategies
Develop personal skills	Education	• advocate for mass media health promotion campaigns that emphasize healthy eating and lifestyle choices • provide nutrition intervention programs with ongoing training and support instead of single intensive sessions • use a multimodal approach to dietary modification including telephone counseling, group lectures, and cooking classes • encourage individuals to self-monitor and assist with goal-setting • improve individuals stress management through developing problem-solving and coping skills • develop support groups and facilitate family involvement
Re-orient health services	Health regions	• require health providers to learn how to counsel patients about health-promoting behavior change • provide incentives for health providers to conduct health promotion • improve ability of the health care system to provide culturally and gender appropriate care • include weight management as an appropriate insured service for health care and/or supplementary health-insurance plans
Create supportive environments	Social Schools Workplace Physical Environment and Urban Development	• denormalize serving and consumption of excessively large food portions through social marketing • require nutrition education and physical activity be provided in schools • develop approved menus for school meals, guidelines for bag lunches, healthier food choices for fundraising, and ban soft-drinks • communicate the return on investment to employers in developing comprehensive worksite health promotion • provide point-of-purchase nutrition information on cafeterias and on vending machines, subsidize healthy food choices • work with trade unions in promoting healthy eating messages • develop guides for urban planners to incorporate physical activity and reduce commute times

Priority Action Areas	Environmental Setting	Strategies
Strength community action	Community	• develop collective kitchens and community gardens to promote access to affordable nutritious food • work with transportation departments to ensure public transport is available between low income areas and food shopping centers • work with grocery stores for home delivery of groceries for homebound individuals • work with local media and price-watch groups in regular monitoring and publishing prices of healthy food choices • provide small grants to community organizations to make changes in the environment that support better nutrition
Build healthy public policy	Food labeling Taxes Policy Development	• require quantitative ingredient declaration on the nutrition labels of multi-ingredient food products • require restaurants, television and print advertisements to provide calorie information on menus and advertisements • develop workplace and school food policies • subsidize the costs of low-calorie nutritious foods • communicate economic and social benefits of a healthy nutrition policy to government departments beyond health • support a tax policy that promotes social equity to address low SES as a determinant of health • develop policy guidelines for neighborhood food access in low income areas

(Adapted from Raine, 2004; Webb, 2001, and Nestle, 2000)

2.2 Evidence Based Practice

2.2.1 Terminology and historical development

Although evaluating interventions in medicine has existed for years, it has been relatively recent that rigorous methods such as randomized clinical trials, a method to reduce bias in comparing interventions, have been used. Professor Archie Cochrane, a Scottish physician and epidemiologist who pioneered use of randomized clinical trials in the 1950s was one of the first to contend that health services must be evaluated on the basis of evidence rather than on anecdotal expert experience, opinion, or tradition (Cochrane, 1972).

With the increased publication of results from randomized control trials it became evident that there were discrepancies between recommendations of experts writing review articles and textbooks, and recommendations obtained from meta-analyses, which quantitatively combine results from several studies to obtain a single estimate of effect or association (Antman, 1992) and that new approaches were needed to summarize current evidence. Ongoing advocacy by Cochrane, who in 1979 (Cochrane, 1979) had indicated a need to develop a critical summary which was regularly updated of all relevant randomized controlled trials, lead to the formation of the Cochrane Collaboration and Database of Systematic Reviews (Chalmers, 1993).

The term 'evidence-based medicine' (EBM) first appeared in the literature in 1991, and was a term coined by Drs. Gordon Guyatt and David Sackett and colleagues from McMaster University's Evidence Based Medicine Working Group who described a new approach to teaching the practice of medicine (Guyatt, 1992) that involved developing skills in critical appraisal of literature. In addition to academic settings (Grimshaw, 1993), it has been shown that teaching EBM skills to clinicians in community hospitals can significantly improve implementation of beneficial therapies (Straus, 2005). Other benefits of the EBM approach that have been recognized by both Cochrane and the McMaster University's Evidence Based Medicine Working Group is that an evidence

based approach can help deal with the increasing volume of literature, introduction of new technologies, increased health care costs, and the increased attention to quality and health care outcomes (Guyatt, 1992, Cochrane, 1979).

Since its inception, the Evidence Based Medicine Working Group addressed the concern that the EBM approach ignores clinical intuition and experience (Guyatt, 1992), and a patient perspective in making decisions (Guyatt and Rennie, 2002). Instead, evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research with the context of patient values, expectations and preferences (Sackett, 2000). The EBM approach also recognizes the importance of both the explicit knowledge of research evidence, and tacit or implicit knowledge of clinical skills, experience, intuition and values (Thornton, 2006). Implementation of EBM involves more than evidence or 'what works' and what interventions or strategies should be used, and should include how the evidence should be delivered, or 'know-how' and tacit knowledge (Nutley, 2003), however less emphasis has been placed on the latter.

In a content review of published papers related to diabetes self-management interventions, not enough information was provided to evaluate an intervention's complexity or to guide its implementation in practice (Leeman, 2006). In particular, there was insufficient information about the number and length of intervention contacts, personnel, financial and material resources needed, and the training required for implementation. In addition, minimal information was provided on the underlying theory and processes used to adapt the intervention to the population or setting, or the context of the implementation (Leeman, 2006).

The EBM approach differs from 'literature based medicine' (Gross, 1999) in that literature based medicine includes reading textbooks, review articles and the occasional primary research article but does not involve a systematic way to retrieve the evidence, appraise and apply the evidence. As Gross indicates (Gross, 1999), literature based

medicine is useful for background reading on a condition, however for decisions regarding interventions, an EBM approach is needed.

2.2.2 What is evidence?

The basis for the evidence component of evidence based practice has been quantitative research evidence, with evidence from systematic reviews and meta-analyses accorded the highest level of evidence followed by randomized clinical trials, observational studies (cohort studies, case-control studies, interrupted time series analyses, and controlled before and after studies) and expert opinion (Sackett, 1996). Systematic reviews follows a protocol to ensure that as much of the relevant research as possible has been considered, and that studies are evaluated and synthesized in a valid way to reduce the risk of bias (NHS Centre for Reviews and Dissemination, 2002).

What is considered to be best evidence depends on the question being asked. Randomized controlled trials are useful to answer questions of effectiveness, whereas issues of prognosis may be best answered by cohort studies, and qualitative research methods are best used to understand experiences and perceptions (Flemming, 2007). For example, relationships between reduced disease incidence and protective factors of certain foods or diet patterns seen in longitudinal cohort studies over a long period of time can provide better evidence than randomized controlled trials involving only single nutrients over a short time (Byers, 1999). In health promotion where the unit of intervention is a community or organization rather than individual, randomized controlled trials are not feasible since it is impractical to find matching controls or allocate randomly (Kemm, 2006). Furthermore referencing only randomized controlled trials can be subject to a publication bias, where only positive trials are published. In order to reduce publication bias, literature searches for the development of systematic reviews or guidelines often include in addition to peer-reviewed journals, conference abstracts, unpublished data from industry and clinical investigators (Johnston, 2003).

Qualitative research findings explore issues and provide depth of experience that quantitative data cannot (Pope and Mays, 1995). Unlike quantitative approaches, qualitative research does not use predetermined variables, but rather seeks to describe and develop insight into experiences without prior assumptions. Although qualitative research can generate hypotheses and quantitative research can test the hypotheses (Morgan, 1998), qualitative research can stand alone and provides a unique perspective in describing phenomena and experiences (Morse, 1996).

Although a qualitative research approach like quantitative research involves systematic empirical observation, evidence from qualitative research has not been routinely incorporated into evidence-based practice. Only recently methods for synthesis of qualitative data (Lucas, 2007), and qualitative and quantitative evidence have been proposed (Dixon-Woods, 2005). Criteria for assessing qualitative studies to develop a hierarchy of evidence specific to qualitative methods have been proposed (Daly, 2007), and literature search strategies to identify qualitative research has been evaluated (Flemming, 2007). By considering qualitative research as part of evidence based practice, clinicians gain new and useful insights about phenomena that are not available in any other manner (Giacomini, 2001).

2.2.3 Clinical practice guidelines

One method to summarize the increasing amount of evidence, and enhance translation of research into practice is the development of clinical practice guidelines. Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances (Institute of Medicine, 1990). Clinical practice guidelines differ from algorithms which are a visual format of the decision making involved in a clinical situation in a step-by-step fashion, and from clinical pathways which organizes and sequences patient care activities of an interdisciplinary team in the day-to-day delivery of care. Both algorithms and pathways focus on delivery of care after decisions have been made about what procedures or services to perform as outlined in clinical practice guideline.

An important motivation for developing clinical practice guidelines is the vast amount of information available on a topic. Over ten years ago, it was estimated a clinician would need to read 17 journal articles a day in order to keep up to date with all research relevant to just one area of clinical practice (Davidoff, 1995). The number of publications relating to cardiovascular disease indexed on Medline and retrieved by this author has almost doubled from 446,204 between 1975 and 1990, to 719,754 between 1990 and 2005. In addition to reading articles, the considerable growth in information means finding specific information is becoming increasingly difficult, time consuming and expensive, since search time increases, while individual time and attention remains limited (Coiera, 2000). For example a study of medical librarians found that the average search time for a clinical question was 43 minutes each (Gorman, 1994).

In addition to the increased burden of finding specific information, inadequate synthesis of multiple pieces of evidence into clinically relevant application is a major obstacle clinicians face when answering clinical questions (Ely, 2002). Alper and colleagues (Alper, 2005) reported that physicians answer more clinical questions and change clinical decisions more often with synthesized evidence. Thus clinical practice guidelines can assist at condensing evidence into a format for clinicians to use.

Clinical guidelines are also needed for the explicit use of best evidence in practice. Inherent in being a professional is having tacit knowledge or individual clinical expertise based on experience. This tacit or implicit knowledge is difficult to codify and explain, and can be based on custom and practices that are highly contextualized (Jimes, 2003). Some of this tacit knowledge is included in the development of clinical practice guidelines and is included as evidence based on consensus. However, what is often lacking in clinical practice guidelines is inclusion of strategies for implementation. For example more could be done to incorporate techniques of behavioral science and how clinician and patient behavior affects the outcome of care (Kaplan, 1989).

With the increased focus on evidence based practice, and concomitant with the increased volume of literature there have been an increase in the number of clinical practice guidelines available. Comprehensive databases of clinical practice guidelines such as National Guideline Clearinghouse have been developed which include more than 1650 guidelines in 2005 (O'Connor, 2005) and include guideline syntheses that provide a comparison of guidelines developed by different associations and countries. In the United Kingdom, the National Institute for Clinical Excellence (NICE; http://www.nice.org.uk) plays a similar role, creating new guidelines and improving relevant existing guidelines so they meet the NICE criteria for quality and content.

2.2.4 Dietitians and evidence based practice

There has been little research to date regarding dietitians' use of evidence in their practice. Slawson (Slawson, 2000) conducted focus groups with clinical dietitians about their perceptions of incorporating research into clinical practice and barriers to participation in research. Dietitians expressed concern over a lack of expertise in research methodology, and suggested collaborating with a dietitian who has had experience with the research process, such as the chief clinical dietitian (Slawson, 2000). In investigating sociodemographic factors that predict dietitians' perceptions, attitudes and knowledge of evidence-based practice (EBP), dietitians who had taken a research course (usually as part of graduate studies), frequently read research articles, worked full-time and belonged to professional organizations were more likely to rate their perception, attitude and knowledge of EBP higher (Byham-Gray, 2005). Although the majority of dietitians reported favorable opinions of EBP, few had acquired the knowledge and skills to use an evidence-based approach in clinical practice, and there is a need to integrate concepts and principles of EBP into the dietetic curriculum (Byham-Gray, 2005).

Thomas (Thomas, 2003) surveyed pediatric dietitians in Australia regarding their knowledge and use of evidence based nutrition, and found dietitians favored EBP but reported lack of time, skills and access to electronic databases as barriers. Burrowes (Burrowes, 2005) surveyed renal dietitians regarding their use of renal nutrition

guidelines and found that lack of tools (computers, food models and calipers), inadequate time due to high numbers of patients to dietitians, and lack of administrative support hindered full implementation of the guideline in their practice. Gardner (Gardner, 2002) surveyed dietitians working as clinical nutrition managers and found that although all dietitians working at the management level had collaborated on at least one research project, half collaborated only with other dietitians, and 27 of 42 (64%) did not report research findings outside their facility. For those not involved in research, the most frequently cited barriers were lack of research skills (65%) and lack of time or staff (41%). Gardner (Gardner, 2002) suggested based on interview data with the clinical nutrition managers that collaboration between disciplines, could enhance the research process. The trend in research utilization that dietitians in leadership or advanced roles report more research utilization than front-line dietitians is similar to the finding in nursing (Hatcher and Tranmer, 1997).

2.2.5 Health care management and evidence based practice

Studies have shown that clinicians and managers differ in their use of evidence. Managers were found to be more interested in using research to guide decision making to control costs (Lorenz, 2005). Research in Alberta's health regions reports that decision-makers take a broad view of what constitutes evidence for implementing in practice including non-randomized quantitative studies, qualitative research, expert opinion and anecdotal reports (Mitton, 2004). As Walshe (Walshe, 2001, pg 429) indicates, though managers and policymakers have been quick to encourage clinicians to adopt an evidence-based approach, they have been slower to apply the same ideas to their own practice.

Managers have a key influence in implementation of clinical practice guidelines by their staff. Nurse managers who created a positive environment of best practices and influenced organizational processes, contributed to the staff use of guidelines (Gifford, 2006).

2.2.6 Implementation gap between knowledge and practice

Despite all the progress into the pathophysiology, epidemiology, clinical interventions regarding cardiovascular disease, and the development of clinical practice guidelines there may be little impact on healthcare and health services, unless findings are adopted into practice.

Studies have reported that health care decisions are mainly based on experience and opinion, with little consideration given to the research evidence (Baessler, 1994; Luker, 1992; Umlauf and Sherman, 1992). In addition there is a substantial time lag of 8 to 15 years between the time technical information is generated and the time it is used in actual practice (Lomas, 1991). Lenfant (Lenfant, 2001) reports that when cardiovascular health is considered from the perspective of what we have yet to apply with what we have learned, that significant opportunities remain to improve the health of the population. A large treatment gap exists between recommended therapies for patients with cardiovascular disease and the care they receive (Pearson, 1997). For instance, in a study of adult patients with dyslipidemia, only 38% of patients achieved NCEP-specified LDL-C target, with higher success rates of 68% among low-risk patients, 37% among high-risk patents, and 18% among patients with cardiovascular disease indicating management of risk factors, especially hypercholesterolemia, in high-risk individuals is sub-optimal (Pearson, 2000). The implementation gap may exist not only at the clinical level but also at the patient level, where patients may be reluctant to comply with guidelines without recognition of benefit and understanding the reasons for the guideline recommendations (Cohen, 2004), or consideration of patients' preferences and values can change evidence from being 'black and white in the abstract' to more 'grey' in practice (Naylor, 1995).

In addition to the treatment gap being due to lack of clinician and patient compliance, others have argued that there may be problems with the guidelines themselves. There have been allegations that guidelines are subject to bias, since composition of the guideline committee determines direction of the guideline (Cohen, 2004), and individuals participating in the guideline committee may not have always disclosed potential conflicts of interest (Hoey, 2006). In regards to the Canadian Recommendations for

Management and Treatment of Dyslipidemia (Genest, 2003) members of the working group were all physicians, and recommendations pertaining to diet therapy are limited. In contrast, the US National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, Adult Treatment Panel III (NCEP, 2002) had a greater emphasis on nutrition and dietary interventions. A physician who is director of a nutrition department chaired the NCEP committee and committee members included a dietitian, nurse and pharmacist in addition to physicians (NCEP, 2002). The Second Joint Task Force of European and other societies regarding prevention of coronary heart disease recommends involvement of dietitians along with nurses and pharmacists and other allied health professionals to improve 'ownership' of guidelines (Erhardt, 2004).

To address concerns about clinical practice guideline quality, guidelines for guidelines (Carter, 1993; American College of Cardiology/American Heart Association, 2004) and appraisal instruments (Agree Collaboration, 2003) for guidelines have been developed. Dietitians of Canada developed a Practice Guidelines Framework that includes 34 key components and rationale for the development of evidence-based practice guidelines (Dietitians of Canada, 2003). However as with other areas of implementation, reviews of published guidelines indicate adherence to methodological standards is inadequate especially in the areas of evidence synthesis and evaluation (Shaneyfelt, 1999).

Canadian Recommendations for Management and Treatment of Dyslipidemia (Genest, 2003) do not indicate how a systematic review of literature or critical appraisal or rating of evidence was done and this approach as indicated by McAlister (McAlister, 2001) may reflect the biases of participants. The rating the levels of evidence seems pervasive in cardiology, with only 13% of 95 cardiovascular CPGs graded their recommendations using a defined levels of evidence scale (Ackman, 2000). In contrast, the Canadian Diabetes association's guidelines including grading of evidence and how expert opinion filled the gaps in areas where evidence is lacking.

Regardless of their limitations, evidence based clinical practice guidelines are an important way to improve health care quality. Studies regarding implementation of guidelines in practices have shown benefits for both the process and outcomes of care (Grimshaw, 1993). However, until recently little attention and support has been given to ensuring findings of research are implemented in practice.

2.3 Dissemination and Implementation of Research

2.3.1 Terminology and historical development

In response to the gap between generation and synthesis of evidence-based research, and its implementation, there has been increased focus on diffusion of innovations, research utilization, knowledge translation (KT), and implementation science.

In the study of evidence-based practice, the term research utilization was originally used, which is seen as the process of transferring research-based knowledge into practice (Hunt, 1996). However it became apparent that knowledge was broader than that derived from research, so the term knowledge utilization was used (Estabrooks, 2006). When it was realized that findings often have to be adapted before implementation, the term knowledge translation was used. The Canadian Institute of Health Research's definition of knowledge translation is one of the most commonly used definitions in the health research area, where KT is defined as the exchange, synthesis and ethically-sound application of research findings, and is seen as an acceleration of the transformation of knowledge into use to improve health, provide more effective services and products, and strengthen the health care system (CIHR, 2004). The Canadian Health Services Research Foundation (CHSRF) was established in 1996 to facilitate knowledge transfer, and to bridge the gap between research and health care management and policy (Canadian Health Services Research Foundation, 2006). In particular the CHSRF has identified the importance of considering context or the conditions of implementation.

In addition to targeted funding of research studies on the knowledge translation of research in practice, Implementation Science, a peer-reviewed journal was launched in

2006. The journal, defines implementation research as the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and care. Implementation science recognizes the study of behavioral influences must occur at both the healthcare professional and organization levels (Eccles, 2006).

While the terms knowledge translation and implementation science have emerged within the last decade, the study of how, why and at what rate new ideas are adopted has been studied over the last century. According to Rogers (Rogers, 1995), Tarde, a French sociologist, during the early 1900s studied the adoption of innovation, the role of social status and opinion leadership in the diffusion process. The Diffusion of Innovations (DOI) theory was formalized by Everett Rogers in a 1962 book called *Diffusion of Innovations*, where diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, pg. 5). This definition includes four elements, namely the innovation, communication channels, time and the social system. An innovation is an idea, practice, or object that is perceived as new by an individual or another unit of adoption (Rogers, 1995). As Rogers (Rogers, 1995) indicates an innovation does not have to be objectively new as measured by the lapse of time since its first use or discovery, but is new to the adopter. Others have defined an innovation as "the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services" (Luecke, 2003, pg 2). Research evidence can be considered an innovation and that the findings of diffusion studies are likely applicable in the healthcare field (Dobbins, 2002).

Inherent in the diffusion of innovation theory is the context or the social system in which the innovation is adopted, highlighting the importance of understanding how the social system affects implementation of evidence in practice. Since the diffusion, acceptance and ultimate success of any innovation is at least as dependent on the social system in which it is placed as on the nature of the innovation itself (Rogers, 1995). Indeed it has

been suggested that if evidence cannot be separated from its social context, then further understanding about the social construction of knowledge is needed (Nutley, 2003).

The diffusion of innovations theory was based on rural sociology studies about the diffusion of hybrid seed corn amongst farmers in Iowa, during a period of rapid development or the 'agricultural revolution'. The theory was further developed with the study of the diffusion of a new antibiotic drug among physicians in the 1950s (Katz, 1963). Since that time, the diffusion of innovations theory has spread to many other fields including public health, economics, marketing, political science and communication (Rogers, 1995). In the last couple of decades the Rogers' Diffusion of Innovations theory has been used to study the implementation of evidence into practice, during a period of the 'information revolution'. More recently, Rogers' Diffusion of Innovations theory has been used to explain the adoption of research evidence among health organizations, for health policy, as well as among health professionals.

Using a theoretical basis for research is important, since theories can help describe, predict and explain behaviour (Eccles, 2005), and can be tested through experimental or empirical observation. In qualitative research the studies that provide the best evidence for practice are those that are generalizable, use an appropriately diversified sample, and use a conceptual or theoretical framework (Daly, 2007).

2.3.2 Innovation decision process in individuals

Diffusion research illustrates that an individual's decision about an innovation is not an instantaneous decision, but is a process that occurs over time and consists of a series of actions. Rogers proposed that individuals progress through five stages including knowledge, persuasion, decision, implementation and confirmation.

The knowledge stage occurs when an individual becomes aware than an innovation exists and gains some understanding of how it functions. For dietitians, this knowledge may come through conferences, journals, books and discussion with colleagues (Byham-Gray,

2005). According to Rogers (Rogers, 1995), factors influencing the knowledge stage include prior conditions of previous practice, needs or problems, culture of innovativeness and norms of the social system. Dobbins (2002) indicated that in the Diffusion of Innovations theory, the dissemination of research evidence occurs at the knowledge stage, when decision-makers and practitioners become aware of new information. Often efforts to introduce an innovation end at the knowledge stage, and have been dependent on the producers of the knowledge, health researchers. However there is also good evidence suggesting that dissemination strategies involving personal, one-to-one contact with the intended audience are more effective in facilitating research utilization compared to group-based strategies, such as continuing education, workshops and conferences (Dobbins, 2002).

The persuasion stage involves formation of a favorable or unfavorable attitude toward the innovation. It is at the persuasion stage that characteristics of the innovation (relative advantage, compatibility, complexity, trialability, and observability), characteristics of the individual, and contextual influences are important factors effecting implementation. Contextual influences include organizational culture or norms of the social system. It is also at the persuasion stage that interpersonal communication from peers who have previously adopted the innovation is important in converting knowledge into action. To persuade individuals to form a favorable attitude, they need to be persuaded or convinced that the innovation has greater value than the current practice. As Landrum indicates, "failure to convince colleagues of the relative merit of an innovation will result in failure of its adoption" (Landrum, 1998, pg. 195).

Relative advantage is the perception an innovation is better than previous practice and demonstrates improved outcomes such as satisfaction, reduced time and effort (Davis, 1997). Compatibility refers to the degree to which an innovation is perceived as being consistent with the existing values, needs and past experiences of potential adopters (Rogers, 1995). Innovations perceived as being similar to current practice are more likely to be adopted. Complexity represents the degree to which an innovation is perceived as difficult to understand and use (Rogers, 1995). Sanson-Fisher (Sanson-Fisher, 2004)

makes the argument that a clinical procedure that is simple and well defined such as altering a patient's drug regimen is more likely to be adopted than preventive activities such as healthy eating, due to the complexity involved in behavior change on part of the patient. Trialability refers to the extent to which the innovation can be implemented on a small scale to determine its advantages or disadvantages (Rogers, 1995). Observability is the degree to which the innovation is visible to others. The visibility of an innovation stimulates peer discussion, and adoption can be facilitated by respected and influential clinicians or opinion leaders (Bero, 1998).

There are a number of characteristics of individuals that influence an individuals decision to implement an innovation. As summarized by Dobbins (2002), characteristics of individuals that promote innovation implementation include cosmopolitanism (assessed by the number of days spent at conferences or interacting with external colleagues), position title, seniority, decision-making authority, as well as education, type of specialization, and participation in research, access to a research consultant and ongoing training in research methods. Likewise there are a number of characteristics that have been identified as barriers to using research evidence. These include lack of autonomy to make a change, insufficient time, lack of administrative support, lack of research evidence, limited critical appraisal skills, and perception that the research findings may not be relevant to their practice (Dobbins, 2002).

The decision stage occurs when an individual receives enough information to form an opinion about an innovation to make a decision to adopt or reject the innovation. Studies suggest that decisions are made based on the values and beliefs of those making the decision, individual experiences, stakeholder interests, and evidence (Kouri, 1997). Lomas (Lomas, 1997) asserts that involvement of relevant decision-makers in the conceptualization and conduct of a research study is the best predictor of its implementation.

The implementation stage happens when the innovation is put into use, and there is an overt change in behavior such as a change in clinical practice or policy. At the

implementation stage, additional information about use of the innovation is acquired. It is recommended that innovation adoption should be measured along a continuum from not implementing to fully implementing. Furthermore, investigation of how the evidence is used in decision-making (resource allocation/reallocation; maintain, discontinue or initiate programs/services) is recommended (Dobbins, 2002).

The confirmation stage involves recognizing the benefits of using the innovation, integrating the innovation into routine practice and promoting the innovation to others. During this stage, measuring the impact of implementing the innovation is important. As reviewed by Dobbins (2002), the impact of implementation can be measured as organizational performance indicators (i.e., decreased costs, improved efficiency), patient outcomes (i.e., decreased mortality/morbidity, increased quality of life, patient satisfaction) or health-system outcomes (i.e., resource allocation, expenditures).

2.3.3 Innovation decision process in organizations

Most of the research regarding implementation of evidence-based practice has been focused on how individuals make decisions regarding patient care, in a relatively unconstrained context (Walshe, 2001). However the highly constrained nature of most practice has lead to a shift in focus away from the individual towards the system or organization in which they operate (Nutley, 2000).

According to Rogers (1995), research on innovations in organizations suggests there are five stages in the innovation decision process, two in the initiation phase (agenda-setting, matching) and three in the implementation phase (redefining, clarifying and routinizing). As Rogers (1995) indicates, the implementation stage is more complex in an organization as compared to individuals, since a number of individuals are usually involved in the innovation decision process, and the implementers are often a different set of people from the decision makers.

The agenda setting phase occurs when a perceived need for an innovation is recognized. This phase includes identifying and prioritizing needs and locating innovations. A performance gap can trigger the innovation process (Rogers, 1995), and certainly communicating the high mortality from cardiovascular disease in the North Karelia project was an important factor leading to widespread implementation of health promotion (Puska, 1995). Matching is defined as the stage in which a problem from the organization's agenda is fit with the innovation.

The implementation stages or research utilization stages are characterized by the organization engaging in activities to transfer the research evidence into health care policy and clinical practice. These include redefining the innovation to accommodate the organization's needs and structure, and or restructuring the organization to accommodate the innovation (Rogers, 1995). Similar to the innovation decision process in individuals, an innovation champion contributes to the success of an innovation in an organization (Rogers, 1995). Clarifying occurs as the innovation is put into more widespread use in an organization, and the organization develops a social construction of the innovation. The last stage includes routinizing or institutionalizing of the innovation where the innovation has become incorporated into the regular activities of the organization and the innovation looses its separate identify.

Organizations that are more likely to respond quickly to innovations are ones that place value on using research evidence in decision-making (Funk, 1995), relatively flat hierarchical system and strong leadership committed to effecting change.

Transforming research into practice is a demanding task requiring intellectual rigor and discipline, as well as creativity, clinical judgment and skill, and organizational savvy and endurance (Kitson, 1996). Implementation of research evidence is influenced by a variety of characteristics as progression from the knowledge or agenda setting stage to the confirmation and routinization stage occurs.

Summary

As the burden of cardiovascular disease continues to grow, it is becoming increasing apparent that a population perspective that addresses the underlying determinants of individual health is needed. Considerable evidence exist for factors that influence the risk of developing cardiovascular disease. However little research has been done on how nutrition evidence for heart health and guidelines are used by dietitians and health regions. Research into improving knowledge translation is important to apply what is known in order to ultimately improve the nutritional health of the population.

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CHAPTER 3. DIETITIANS' PERCEPTIONS AND PRACTICES OF HEART HEALTH PROMOTION

3.1 Introduction

Cardiovascular disease remains a leading cause of mortality (Heart and Stroke Foundation, 1999). Considerable research has been done on the identification of measurable factors that predict the development of cardiovascular disease. These risk factors include dyslipidemia, hypertension, diabetes, smoking, poor diet and physical inactivity. Behavioural strategies to reduce cardiovascular disease have focused on modifying risk factors through individual lifestyle change. The Nurses Health Study (Stampfer, 2000) showed that individuals that have a healthy lifestyle avoid more than three-quarters of the risks of developing coronary heart disease. The Lyon Heart Study (de Longeril, 1999) suggested that dietary modification in individuals with coronary heart disease could reduce the risk of recurring coronary heart disease by half. The recognition of the relationship between the modifiable risk factors and cardiovascular disease has lead to national initiatives on developing healthy living strategies for individuals to address the lifestyle risk factors that contribute to the development of chronic disease.

Focusing on individual behavior change alone is not sufficient to reduce cardiovascular disease at a population level (Winkleby, 1997). Rather, understanding the mechanisms by which societal factors (e.g. food and tobacco policies, urbanization), affect development of risk factors could lead to new approaches to prevent development of risk factors across the population which in turn could reduce cardiovascular disease substantially (Yusuf, 2001). This approach that recognizes a focus on the individual or development of personal skills should be considered in conjunction with ways to reorient health services, strengthen community action, create supportive environments and build healthy public policy is part of the Ottawa Charter for Health Promotion (WHO, 1986). Health promotion is the process of enabling people to increase control over circumstances that affect their health and to improve their health (WHO, 1986).

The health care system's traditional focus on disease treatment and illness care has, in theory, expanded to include disease prevention and health promotion. Not long after Achieving Health for All, a framework for health promotion, was released by Health and Welfare Canada, opportunities for involvement by dietitians were outlined (Nielsen, 1989), and a national plan of action on nutrition, *Nutrition for Health: An Agenda for Action* (Health Canada, 1996) was developed that built on the population health model. More recently, Dietitians of Canada indicated the role of dietitians is to utilize health promotion, disease prevention and treatment strategies that support communities and individuals to make healthy eating and active living choices (Dietitians of Canada, 2001). The American Dietetic Association has developed a position statement on the role of dietetic professionals in health promotion and disease prevention and indicates dietetics professionals should be actively involved in promoting optimal nutrition in community settings and should advocate for healthy eating in programs at all levels (ADA, 2002; ADA 2006). However knowledge of the benefits of health promotion has not necessarily transferred into dietetic practice. Little work has been done to document the degree of adoption and implementation of the health promotion approach, although the evidence on translation of research into practice in other health fields indicates adoption and implementation rate is low (Maibach, 2006). In particular, little is known about how dietitians working in the area of heart health perceive health promotion and utilize principles in practice. The aims of this study were to explore dietitians' perceptions of heart health promotion, investigate dietitians' knowledge and practices addressing risk factors and conditions relevant to heart health promotion, and to estimate the level of heart health promotion implementation by dietitians.

3.2 Methods

3.2.1 Methods Rationale

Due to the lack of literature concerning dietitians and heart health promotion, the initial part of this research was exploratory and qualitative. Qualitative methods provide information from participants' perspectives and are not influenced by predetermined categories of analysis (Secker, 1995). To investigate the issue using solely quantitative

methods would rely too heavily on assumptions by the researchers about heart health promotion in dietetic practice. To complement the qualitative data regarding dietitians' perceptions of heart health, a survey of dietitians in health regions throughout the province regarding their knowledge, belief, confidence and frequency in addressing determinants of heart health from an individual perspective of physiological, behavioral and psychosocial risk factors as well as environmental risk conditions that influence heart health was conducted.

3.2.2 Sampling

For the qualitative phase, a purposive sample (Fetterman, 1989) of dietitians that work in the area of heart health, which includes cardiology, diabetes, outpatients and community settings at both the provider and management level was drawn. Purposive sampling was important to ensure dietitians were selected from all aspects of heart health who had different education backgrounds, varying years of experience, and diverse levels of responsibility within the organization. Since the primary researcher (CW) was on leave from a dietitian management position in a regional health authority, participants were recruited by a third party to avoid putting colleagues in a potentially compromising situation regarding their participation in the study. Potential participants were sent an invitation to participate by an electronically mailed message from a clerical staff member from that region. Dietitians were recruited until saturation (Sobal, 2001), that is, no new themes emerged from the focus groups. Before the beginning of each focus group, participants were informed that each session would be audio-taped and transcribed and that their responses would be coded anonymously. Participants were provided with an information letter and signed informed consent was obtained from all participants (see Appendix 1).

For the survey, potential participants were recruited through dietitian leads for each health region. The dietitian lead is the dietitian in the region with professional and administrative responsibility for providing nutrition services and is in charge of the dietitians for that region. In 2004, clinical dietitian leads were contacted about

participation in the study and were sent an e-mail explaining the study in the form of an information letter with a link to complete the survey on-line. Dietitian leads were asked to forward the e-mail to dietitians working in their region in the areas of heart health and indicated the number of dietitians the survey was sent to. A follow-up e-mail was sent to dietitian leads asking them to remind participants to complete the survey. Consent was implied with participants completing the on-line survey.

Health Research Ethics Approval was obtained from the University of Alberta Health Sciences Faculties, Capital Health Authority, and Caritas Health Group (Appendix 1).

3.2.3 Data Collection - Qualitative

Focus groups were conducted from November 2002 to February 2003. A trained dietitian facilitator conducted the focus groups in which participants were asked for their comments and reflections on heart health promotion in their practice, with an open-ended question of what does health promotion mean to them.

Sessions were tape-recorded and transcribed verbatim and themes were formed through thematic hierarchical analysis. The participants in the focus groups completed a validation questionnaire in June 2003 to determine how well the themes represented their perceptions (Appendix 3).

3.2.4 Data Collection - Quantitative

The survey instrument (see Appendix 2) was developed in part from the Alberta Heart Health Project's validated assessment of health promotion at the health region level (Anderson, 2004; Barrett, 2005; Plotnikoff, 2005). Psychometric analyses of the survey data was done to validate the survey. Principal component analysis was done to confirm unidimensionality of the scales, and Cronbach alphas were calculated to assess internal consistency of the measures and ranged from 0.75 to 0.95 (Anderson, 2004; Barrett, 2005; Plotnikoff, 2005). In particular dietitians' knowledge of heart health and orientation towards health promotion was assessed. The questionnaire assessed

dietitians' belief, confidence and frequency in addressing physiological (high blood pressure, high blood cholesterol, obesity, genetic factors), behavioral (smoking, poor diet, inactivity), psychosocial (lack of social support, stress, low self-esteem, low socio-economic status) and environmental (poverty, poor work conditions, discrimination, income gaps) risk conditions for cardiovascular disease. Respondents indicated the extent of their agreement with statements on a five-point Likert scale, where response options included strongly disagree, disagree, neutral, agree and strongly agree. Demographic variables were collected including area of practice, years in practice, level of education and information on personal health behaviors regarding smoking, diet and activity.

The questionnaire was reviewed and pilot tested by dietitians and researchers (n=12) regarding clarity, content, and time for completion. Dietitians included in the pilot test were those working in research and education consulting in Alberta (n=5) and at the provider (n=5) and management levels (n=2) in heart health in BC and Ontario so as to not include the target group. Participants in the pilot test varied with their length of time in practice, with 2 dietitians having worked less than 5 years, 3 having worked 5-10 years, 5 dietitians/researchers having worked 10-20 years, and 2 dietitians having worked more than 20 years in the profession. The pilot test aimed to identify questionnaire item ambiguities and to verify clarity of the questions. Pilot test respondents provided comments on the questionnaire which were taken into account when developing the final version of the questionnaire. One of the dietitians who pilot tested the questionnaire indicated:

> "I found myself wondering what, if anything, a dietitian counseling a patient would do about ageism, sexism, income disparity in a population, low self-esteem. . . Related to this, I think that in training and/or CE [continuing education] programs for dietitians we do nothing to prepare ourselves for addressing some of these issues in either our counseling or advocacy roles [and may not] even recognize these as things within the domain of dietitians' responsibilities. . . Related to the above, 'genetic factors'...what sort of counseling would we expect dietitians would do about that? Likewise with 'poor work conditions', 'poverty', etc. "

3.2.5 Data Analysis - Qualitative

Focus groups were transcribed verbatim and read through line by line in order to develop sensitivity to the content of the data. The data were first coded by capturing the substance of the data and breaking it up into smaller segments, then identifying and joining together substantive codes or concepts into categories (Guest, 2003).

Qualitative data analysis involves synthesizing large quantities of text. Thematic analysis is a strategy to synthesize data by applying codes or themes to the raw data (Rothe, 2000). Hierarchical thematic analysis takes into account the interrelationship between individual themes as they occur in the data. Hierarchical analysis creates taxonomies based on the researcher's interpretation of conceptual relationships between themes based on research objectives and theory (Guest, 2003). In this case, themes were analyzed according to the components of the Ottawa Charter for health promotion and Roger's Diffusion of Innovations theory (WHO, 1986; Rogers, 1995). The diffusion of innovations is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). There are stages in the innovation-decision process. The first stage is knowledge about an innovation, this is followed by persuasion when an individual forms an attitude or belief about the innovation, and then decision to adopt or reject the innovation. Implementation stage occurs when the innovation is put into use, and confirmation occurs when an individual seeks reinforcement of the innovation-decision already made. Roger's Diffusion of Innovations theory has been used by other investigators (Poon, 2006; Ash, 2001) to assess level of adoption of innovations such as healthcare information technology through a similar qualitative analysis of focus group data.

Rigor in qualitative research is demonstrated through accurately representing study participants' experiences. This is done through ensuring credibility and transferability (Streubert and Carpenter, 1999). Peer debriefing occurred where findings were discussed with dietitian colleagues working academically (KR) and in clinical research who are knowledgeable about the phenomena to explore alternative explanations. This helps ensure transferability or the probability that the study finding have meaning to others in

similar situations. This process helps to prevent biases the researcher may develop and to explore alternative explanations for findings. To confirm credibility of findings member checking was done to see whether the participants recognize the findings to be true to their experiences. Member-checking was performed by sending participants a summary of the final categorizations and themes via e-mail and asking them to confirm the findings are representative of their experience. Thirteen of the 20 participants responded to the request for feedback regarding interpretation of results. Overall there was 93% agreement the themes represented dietitians' perceptions, with a 100% agreement that health promotion means a population focus and 88% agreement that health promotion means an individual focus (see Appendix 3).

3.2.6 Data Analysis - Quantitative

For the survey, data were compiled on-line using Zoomerang™, a web-based survey tool, and downloaded to an Excel spreadsheet. Statistical analyses were performed using the Statistical Program for the Social Sciences (Windows version 12, 2005, SPSS, Inc, Chicago, IL). Descriptive statistics were generated for all reported measures. Frequency distributions were generated for all study questions and open-ended responses were summarized. To facilitate comparison across risk factor categories (physiological, behavioral, psychosocial and environmental), mean scores were calculated by summing the scores of all items in each risk factor category and dividing by the total number of items.

Parametric statistics were used since scores for knowledge, belief, confidence and frequency in addressing risk factors are considered to be continuous measures with interval scale properties. To determine the reliability for the extent to which items on the questionnaire relating to risk factors measure the same characteristic, Cronbach's alphas for each risk factor category were calculated (ranging from 0.64 to 0.94). The statistical significance of the difference in mean scores between risk factor categories were assessed using one-way analysis of variance (ANOVA). Use of ANOVA was important to reduce the probability of spurious significance due to the number of variables. Where the

ANOVA was significant, $p < 0.05$, Bonferroni post-hoc analysis were used to specify the nature of the differences.

3.3 Results

3.3.1 Focus groups

Of the 30 dietitians working in the area of heart health in the Edmonton region, 20 participated in the four focus groups. Three focus groups (n=3, 4, 5) consisted of dietitians working at various provider levels including primary (1°) or ambulatory care, secondary care (2°) such as cardiac rehabilitation, and tertiary care (3°) in acute care cardiology and transplant, respectively. The fourth focus group (n=8) consisted of management (M) with both clinical and community responsibility in heart health across the region. There was representation from dietitians who had recently graduated with less than 5 years of practice (20%), those with 5-10 years of experience (25%), 10-20 years (20%) and those with more than 20 years in practice (35%), as indicated in Table 3.1.

The over-arching themes that emerged from the focus groups regarding dietitians' perception of heart health promotion as either a focus on individuals or population approach are summarized in Table 3.2. In order to portray dietitians' experiences, their own words are used as the best description of the particular theme, with an indication of their practice area.

3.3.1.1 Health promotion means focusing on the individual

All participants described health promotion as focusing on the individual and including a *healthy lifestyle approach* in terms of health behaviors of individuals such as not smoking, eating healthy and being physically active. The importance of a healthy lifestyle approach was seen in all aspects of heart health including tertiary areas where patients with heart failure and cardiac transplantation presented. Dietitians also mentioned their own personal role in modeling healthy food selection.

> " making positive changes to their current living habits . . . includes everything related to smoking, activity and eating habits. .."1°, 2°, M
>
> " keep things like fresh fruit in my office so people can see how I also try to role model [healthy eating]" 2°
>
> " promoting heart healthy eating before people develop heart disease, also to recognize who already have heart disease and to make them realize that eating well can still result in beneficial changes" 2°
>
> " you're still promoting heart health even though they [patients] may already have heart disease" 3

Dietitians working in cardiac rehabilitation programs identified the importance of working with individual patients in *setting realistic goals* and monitoring progress toward goal achievement. Dietitians also indicated that patients were more motivated to set realistic goals once they experienced a heart attack.

> "helping patients identify the points of action for them personally, you know, to try to prioritize their goals" 2°
>
> "It's not like 'when am I going to have a heart attack?' its like ' I already had my heart attack and when am going to have my next one?' So there's more of a realistic attitude on the part of the patients that they now have heart disease" 2°
>
> "letting people know about what they can change" 2°

Dietitians assisting patients in setting goals and monitoring progress toward goal achievement is an important part of self-regulation. Goal-setting is considered to be a useful technique that encourages patient motivation and helps achieve better outcomes (Siegert, 2004). Patients often are overwhelmed by large goals that seem unachievable, whereas smaller subgoals can be more realistic (Koenigsberg, 2004). The finding that dietitians working in cardiac rehabilitation indicated the importance of goal setting is similar to the findings of Gilboy (1994) that outpatient dietitians used more compliance-enhancing counseling practices than did inpatient dietitians.

The recognition of the importance of promoting health in patients with cardiovascular disease is noteworthy, since as Clark (2006) indicates patients with heart failure typically

receive care that is almost exclusively focused on disease management, and health care providers often pay little attention to health promotion. Dietitians reporting patients had more realistic goals for prevention once they had experienced a heart attack is similar to the concept of health promotion in hospitals, where episodes of acute injury or illness can be used as an opportunity to promote health through providing and organizing rehabilitation (Pelikan, 1997).

Most dietitians thought health promotion meant *providing education* and education resources regarding an individual's level of risk and lifestyle modification and behavior change. Many dietitians indicated Canada's Food Guide was a useful education tool, and stated the importance of providing consistent education messages.

> "bring awareness to the individual about what risk factors are that influence heart health" M

> "make available, practical, reliable resources for them, something that is very easy to read, easy to comprehend, make it seem like it's not difficult to do" 2°

> "a lot of people assume that everyone has heard of Canada's Food Guide and that they're just so tired of it, and was three men [in the cardiac class] and none of them had seen it before including their wives" 2°

> "providing credible and accessible resources to all levels conveying consistent messages across the region" 1°

The aim of providing consistent education messages is important, since cardiac patients often receive a high number of variable recommendations in many patient education materials (Plous, 1995). However, as some of the dietitians indicated providing education is not enough for behavior change, and dietitians need to work with their patients in *developing personal skills.*

> "providing knowledge is the first step . . . but increasing knowledge just doesn't work in terms of heart health promotion so you need to find strategies and ways to build the skills they need to do healthier behaviors" 2°

> "practical ideas they [patients] can take home with them. . .If you just say increase your legumes but if I say add lentils to your soup to increase your soluble fiber that's going to be a better message" 2°

"make suggestions to decrease barriers. Everybody has a barrier whether it's physical [transportation for grocery shopping] or mental" 1°

A number of dietitians working at the management level indicated health promotion involved a *personal responsibility for health,* where individuals are seen to be responsible for health choices. This approach recognizes many individuals, often despite adverse environmental circumstances, do manage to change their diet and exercise patterns and quit smoking (Minkler, 1999).

"Enables them to take responsibility for their heart health behaviors to improve health outcomes" M

"Its how to have people who haven't even thought of this as a personal issue to have some realization that they do have some personal responsibility and then continue to take some steps on their own" M

"Increases expectations for self-directed promotion of heart health and there is a responsibility for us all to take measures in promoting our own heart health." M

"Help them [individuals] take some responsibility for themselves in moving from one stage to another" M

3.3.1.2 Health promotion means a population focus

Some of the dietitians indicated health promotion means a population focus. A dietitian working at the management level perceived health promotion as "targeting vulnerable groups". Vulnerable groups are those with an increased susceptibility to adverse health outcomes, including nutritional and food issues such as food security. This approach is more consistent with a population health approach that aims to improve the health of the entire population and to reduce health inequities among population groups (Health Canada, 1998, pg 1).

"using population data to target vulnerable groups" M

"food security . . .which is related to heart health as well" 1°

Dietitians working in management and in cardiac rehabilitation indicated the importance of *strengthening community action* by utilizing existing resources such as grocery shopping tours in the community to enhance self-help and support. One of the dietitians

working at the management level indicated the role of health promotion as the empowerment of communities with community members taking control of their endeavors and directions.

> "having individuals have impact on their community and public policy to put measures in place to promote heart health initiatives that have an impact on larger groups" M

> "spread message to the public about how they can change their behavior or lifestyle to reduce their risk of developing heart disease" M

> "linking to messages in grocery stores" M

> "awareness for patients and staff of community resources like grocery shopping tours at Save-On [Foods] as a free resource" 2°

A couple of dietitians saw communication as a central part of health promotion, with *mass media and internet* as an opportunity for wider-reach of health promotional activities.

> "everything from media, radio, TV and press releases, messages given out by physicians and dietitians" M

> "conveying consistent messages across the region, . . using community, physicians, media, internet" 1°

A few dietitians working at the management level indicated that health promotion goes beyond health care and includes *building healthy public policy* and working inter-sectorally in *creating supportive environments*. Dietitians identified anti-smoking bylaws as an example of healthy public policy, and suggested working with sectors outside the health sector to create an environment that support healthy eating.

> "public policies such as the no-smoking policy in municipalities" M

> "public policy to put measures in place to promote heart health initiatives that have an impact on larger groups. . examples are the anti-smoking bylaws" M

> "interfacing different organizations that have common objectives like reducing obesity, promoting healthy eating and reducing smoking. So not just heart health organizations, but other organizations that have common objectives" M

Overall, a major theme that emerged from the data was the perception of heart health promotion from dietitians working at the provider or clinical level as being focused on individual behavioral risk conditions as compared with dietitians working at a management level as heart health promotion being both individual and a population focus. Emerging from a management focus group was the concept of personal responsibility for health and individuals taking action to improve their own health. Provider level dietitians recognized the need for education, and development of personal skills to remove barriers at the individual level whether it was improving personal skills or recognizing personal limitations. In contrast, dietitians working at the management level identified the need to remove barriers at the community level such as policy changes, and working with other sectors beyond heart health to reduce obesity and promote health eating.

The difference in perception of health promotion as focusing on individuals as compared with a population focus was further investigated in the survey of dietitians across the province regarding the knowledge, belief, confidence and involvement in addressing risk factors and conditions relevant to heart health promotion.

3.3.2 Survey results

3.3.2.1 Sample characteristics

The survey was distributed by the clinical leads in each of the 9 health regions to 135 dietitians across Alberta. There were 51 respondents for a response rate of 34 %. Table 3.3 shows demographic characteristics of the sample population. Respondents were from all health regions, who counseled an average of 9 patients per week regarding cardiovascular disease, and had been in practice for a mean of 10 years, ranging from 0.5 to 27 years. Few respondents (6%) had a Masters degree with the majority of respondents (94%) having a bachelor's degree. Close to half of respondents (42%) worked in primary care and one-third (28%) worked in tertiary care with 23% having a regional mandate. All respondents were non-smoking, consuming on average 5.8 servings of vegetables and fruits per day (range 4 – 8 servings/day), with a mean BMI of

22.8 ±2.4 kg/m^2. Respondents reporting being active on an average of 4 days/week (with a range from 1 day to 7 days), and being active on average 45 minutes/day (with a range from 15 minutes to 120 minutes).

There were differences in dietitians' use of information with 74% of dietitians reporting using the Canadian Recommendations for Management of Dyslipidemia and Prevention of Cardiovascular Disease (CMAJ, 2003) which focuses on individual approaches to cardiovascular risk reduction, whereas only 18% of dietitians reported using the American Heart Association Population based guidelines at the Community level (AHA, 2003) guideline on an 'often' or 'always' basis (see Table 3.3).

3.3.2.2 Knowledge and practices regarding risk factors and conditions

3.3.2.2.1 Belief risk conditions should be addressed in dietetic practice

Mean scores (± standard deviation) show individual respondents agreed to strongly agreed they should address physiological (4.65 ± 0.32) and behavioral risk factors (4.68 ± 0.53) for cardiovascular disease in dietetic practice. Within the risk factor categories, belief that genetic factors (i.e. family history) should be addressed was lower (3.88 ± 0.98) than belief blood pressure (4.78 ±0.46), blood cholesterol (4.94 ± 0.24) and obesity (4.98 ± 0.14) should be addressed. Belief that smoking should be addressed was lower (4.28 ± 0.83) than belief poor diet (4.94 ± 0.24) and physical inactivity (4.82 ± 0.39) should be addressed (Table 3.4).

In comparison with physiological and behavioral risk factors, mean scores are significantly ($p < 0.001$) lower for both psychosocial risk factors (3.75 ± 0.62) and environmental risk conditions (3.15 ± 0.78), see Table 3.4. In particular, respondents disagreed or were neutral that discrimination (2.90 ± [illegible]6) and income gaps (2.98 ± 0.94) and environmental risk conditions for cardiovascular [illegible]se should be addressed. As indicated in the questionnaire (see Appendix 3), examples of discrimination included sexism, ageism, racism. Respondents were 'neutral' in their belief poverty should be addressed as an environmental risk condition for cardiovascular disease in their dietetic practice.

3.3.2.2.2 Knowledge of risk conditions

Overall respondents indicated they had a 'moderate' to 'a lot of knowledge' of physiological (4.17 ± 0.59) and behavioral (4.28 ± 0.53) risk conditions contributing to cardiovascular disease. Respondents indicated they had some knowledge regarding psychosocial risk factors (3.20 ± 0.90) but only a little knowledge of environmental risk conditions (2.79 ± 0.99). Although respondents had some level of knowledge of poverty (3.3 ± 1.05) most indicated they had little knowledge of poor work conditions (2.80 ± 1.14), discrimination (2.32 ± 1.11) and income gaps (2.84 ± 1.08) as risk conditions for cardiovascular disease.

3.3.2.2.3 Confidence in addressing risk conditions

With the exception of genetic factors and smoking which dietitians indicated they were moderately confident in addressing, dietitians indicated they were very confident to extremely confident in addressing poor diet (4.76 ± 0.48), blood cholesterol (4.60 ± 0.53), obesity (4.42 ± 0.61) blood pressure (4.24 ± 0.66) and physical inactivity (4.28 ± 0.67) risk conditions for cardiovascular disease in their practice. In contrast, with the exception of stress which dietitians indicated they were moderately confident in addressing, dietitians indicated they were not at all confident to somewhat confident in addressing psychosocial (2.76 ± 0.84) and environmental (2.13 ± 0.94) risk conditions.

3.3.2.2.4 Frequency in addressing risk conditions

Dietitians indicated they 'often' to 'always' addressed poor diet (4.88 ± 0.39), blood cholesterol (4.80 ± 0.4), obesity (4.72 ± 0.50), physical inactivity (4.70 ± 0.51), and blood pressure (4.38 ± 0.70) in their practice. Despite dietitians lowered knowledge and confidence in addressing smoking, dietitians reported 'often' addressing smoking (3.96 ± 1.05) in their dietetic practice. However genetic factors (family history) was only occasionally addressed by dietitians, and is consistent with their lowered knowledge and confidence in addressing genetic factors as a risk factor for cardiovascular disease.

In spite of dietitians agreement of the importance of addressing poverty, and their rating of some to moderate knowledge of poverty, dietitians reported seldom to occasionally addressing poverty. Likewise in spite of dietitians agreement and some to moderate level of knowledge of lack of social support as a risk factor for cardiovascular disease, dietitians reported seldom addressing social support in their practice. In contrast, dietitians reported occasionally to often addressing stress as a risk factor. Dietitians indicated they seldom addressed low self-esteem (2.18 ± 1.00) and socioeconomic status (2.48 ± 1.01), and seldom to never addressed poor work conditions (1.92 ± 1.0) discrimination (1.58 ± 0.97) and income gaps (1.60 ± 0.99) in their practice.

While perceived knowledge of traditional risk factors including physiological and behaviour components is high (4.17 ± 0.59, and 4.28 ± 0.53 respectively), knowledge of psychosocial (3.20 ± 0.90) risk factors was lower and knowledge of environmental (2.79 ± 0.99) risk conditions was lacking (see Table 3.4). The highest frequency of addressing risk factors was for poor diet, high blood cholesterol, obesity, physical inactivity and high blood pressure, with smoking and genetic/family history addressed less frequently. Stress and lack of social support was addressed more often than low self-esteem and low socioeconomic status. However few dietitians considered environmental risk conditions such as poverty, poor work conditions, discrimination and large gaps in income which contribute to cardiovascular disease.

Despite lowered knowledge, confidence and frequency in addressing psychosocial and environmental risk conditions, respondents indicated a stronger belief that psychosocial and environmental risk conditions should be addressed.

3.4 Discussion

Four major findings have arisen from this study. *First, dietitians perceive heart health promotion as primarily focusing on individual approaches rather than addressing the broader determinants of health.* In particular dietitians participating in the focus groups gave many detailed and personalized examples of how they promote healthy lifestyle,

provide education and assist with developing personal skills of individuals. This finding is consistent with others, where patient education is seen as the cornerstone of cardiovascular disease management programs (Krumholz, 2006). Although dietitians working at the management level who participated in the focus groups stated that health promotion also includes a population focus, only a few general examples were given. In addition, dietitians working at the management level emphasized that health promotion means a personal responsibility for health, a viewpoint that was reflective of the provincial health care context at that time. For instance, in the Mazankowski report (A Framework for Reform - Report to the Premier's Advisory Council on Health, 2002), one of the report's key recommendations was an individual responsibility "to stay healthy," since "making healthier choices can significantly reduce the incidence of heart disease." This was followed in 2003 with the development of a province-wide initiative called *Healthy U*, an information and education campaign to encourage individual Albertans to eat healthier foods and increase their physical activity, implying individuals are responsible and have control over their health choices.

However, a focus on individual change alone is limiting for a number of reasons. Focus on individuals implies individual responsibility or an " ideology of choice" that individuals are responsible for and choose their disease, with the potential for this approach to "degenerate into a victim-blaming stance" (Lowenberg, 1995). Steinbrook (2006) expresses concern that measures to promote personal responsibility for health behavior may be coercive and have adverse consequences. Since for many individuals choices may be unavailable (Paluck, 2006), and 'life-chances' (Rutten, 1995) may be a larger determinant of lifestyle. In addition encouraging individual behavior change has only a limited impact on the distribution of disease in communities. Although there have been some improvements in individual lifestyle behavior change on a population level, such as reduction in amount of calories from fat from 40% in 1970 to 30% in 1990s, an increase in physical inactivity from 43% to 52% and an increase in obesity from 19% to 30% resulting in a projected increased in cardiovascular disease (Heart and Stroke Foundation, 2006). In order to reduce the burden of cardiovascular disease increased emphasis is needed on health promotion to address the underlying conditions such as

social and economic concerns that lead to exposure to causative factors. For example in a community that has a tobacco control policy, it is easier for an individual to quit smoking (Yusuf, 2001). Thus, individual responsibility for health needs to be viewed within the context of a broader social responsibility (Minkler, 1999).

Second, emerging from the focus groups was a tendency for dietitians working at the management level to have a better understanding of health promotion concepts as compared with dietitians working at the provider level.

Dietitians working at the provider level viewed health promotion as being focused on individual approaches as reflective of their role in providing care for individual clients in terms of behavior and lifestyle modification. This finding is similar to nurses working in the hospital setting who are often unaware of broader health promotion concepts (Whitehead, 2005). A study of attitudes to cardiovascular health promotion among physicians and nurses dealt exclusively with the concept of health promotion as health education and skills in lifestyle counseling for behavior change (Steptoe, 1999). In a qualitative study of community dietitians' experiences of their practice roles, many dietitians described the challenges of the food and eating environment, and that healthy food choices are difficult due to the types of foods available, only a few participants indicated interacting with the food system was an appropriate practice role for them, either through policy or management strategies (Devine, 2004).

It is encouraging to see support for population approaches to health promotion amongst dietitians working at a management level. This is in contrast to nurses where research shows that lack of senior management support was the most commonly cited barrier for non-implementation of innovation in practice (Bradley, 2006), and that nurses managers' focus on short-term thinking and cost-reduction which limits implementation of innovations in practice (Hewison, 1996).

Additional research should confirm the differences between dietitians working at the provider level and manger perspectives, since dietitians working at the management level

may be more amenable than clinicians in using health promotion in their practice, and may represent the most effective target group to improve implementation of health promotion in practice.

Third, dietitians have a high level of knowledge, belief, confidence and frequency in addressing physiological and behavioral risk factors. Dietitians frequency in addressing blood cholesterol (4.8 ± 0.40), blood pressure (4.4 ± 0.70), obesity (4.7 ± 0.50) as physiological risk factors was high, with reduced frequency and confidence in addressing genetic/family history (3.7 ± 1.16, and 3.5 ± 0.14 respectively). This lack of confidence of dietitians in addressing genetic/family history is similar to the findings of others. Hanning (Hanning, 2002), reported that although dietitians sometimes to always considered family history, few dietitians have high confidence in addressing the genetic component of patients' conditions (Lapham, 2000). Dietitians recently indicated that they are interested in learning more about genetics and nutrigenomics (Rosen, 2006) which could provide an opportunity to improve this aspect of counseling.

Dietitians' frequency in addressing poor diet and physical inactivity as behavioral risk factors was high, with a mean of 4.9 ± 0.39 for diet, and 4.7 ± 0.51 for physical inactivity. The recognition of the importance of addressing physical inactivity as a component of health promotion as well as an important risk factor which dietitians indicated they often addressed, is similar to the finding of another study conducted among dietitians which indicated they had a role in promoting active living (Spidel, 2004). Respondents also reported being physical active. This is important given the well-documented link between other professionals' personal health practices and their patient counseling practices (Frank, 2000).

Fourth, the level of implementation of heart health promotion in dietitians' practices is in the preliminary stage, with inadequate knowledge of heart health promotion, especially as it pertains to environmental risk conditions for heart health. Dietitians mean knowledge of environmental risk conditions was 2.79 ± 0.99 which was significantly ($p<$

0.0001) lower than their knowledge of individual risk factors such as physiological (4.17 ± 0.59), behavioral (4.28 ± 0.53) and psychosocial (3.2 ± 0.90).

The reduced awareness of community or population based health promotion concepts, some have argued, could be due to diversity in understanding of health promotion concepts or gaps in the literature. Labonte (1993) suggests there are medical, behavioral and socio-environmental perspectives of health promotion. Particularly in the US, health promotion has been narrowly defined, focusing primarily on individual behaviors, risk factor reduction, and lifestyle (Morgan, 1998). Whitehead (2005) makes the case that the majority of health promotion nursing examples in the literature involve health education activities – behavioural and individualistic programs – rather than organizational and structural reform. Unlike the large body of evidence that is available that identifies behavioral risk factors and demonstrates efficacy of behavioral intervention, limited evidence is available regarding nutrition interventions relating to psychosocial and environmental risk conditions as determinants of cardiovascular disease. In an audit of public health and health promotion journals, Oldenberg and colleagues (Oldenberg, 1999) suggest health promotion research appears not to be focusing sufficiently on the social or environmental contexts of health behaviours, and more emphasis needs to be placed on implementing social or environmentally focused health promotion strategies. As well when health promotion is approached from a multi-sectoral perspective, individuals rarely go outside their own sectors to source evidence, and may have difficulty finding studies since in some sectors, many relevant studies are unpublished or are only available as reports (Armstrong, 2006).

3.5 Implications for Practice

There are several theory-based strategies to increase dietitian knowledge of nutrition in heart health promotion. The Diffusion of Innovations theory indicates that strategies to increase awareness at the knowledge stage include focusing on the innovation (Rogers, 1995). The innovation in this case is evidence and concepts of nutrition in heart health promotion. Given the complexity of decision-making in health promotion there is a need for synthesis of qualitative and quantitative data into reviews or guidelines. As Green

and colleagues (Green, 1996) have noted, "complexity breeds despair." Emphasis on environmental determinants of health can lead practitioners to the conclusion they can have little impact, unless this is combined with practical strategies practitioners working at various levels can undertake.

The American Heart Association (AHA) published a guide for improving cardiovascular health at the community level, targeting public health practitioners, healthcare providers and health policy makers (Pearson, 2003). However this guideline is not specific to nutrition and only 18% of Alberta dietitians reported using this guideline often or always. A follow-up guide from the AHA focused on implementation and indicates there needs to be programs or mechanisms to implement community or health promotion guidelines like there is for cardiovascular disease treatment (Veazie, 2005).

For individuals at the persuasion stage, Diffusion of Innovation theory (Rogers, 1995) suggests there are five factors that can influence the implementation of an innovation in practice. These include: the relative advantage(s) and compatibility of the criteria with current practices, complexity of implementing the criteria, the trialability of the criteria, and observability. In regards to communicating relative advantage(s) and compatibility of the criteria with current practices, Maibach (2006) suggests from a marketing perspective on disseminating evidence-based approaches to health promotion is to explore with prospective adopters their perspectives on how health promotion programs can advance their organization's mission.

In regards to observability and trialability of implementing health promotion, Maibach (2006) suggests building distribution channels to deliver programs to adopters and to improve access to programs that are consistent with health promotion guidelines. In addition, by involving dietitians working at the provider level in a health promotion program will improve their knowledge and awareness of health promotion concepts. Wallerstein and Bernstein (1988) have noted, the very process of planning and carrying out a health promotion program impacts individual consciousness about responsibility and the broader causal factors in health.

Lastly, more work could be done in education and training of dietitians regarding health promotion to increase their knowledge and understanding of health promotion. Although assessment of psychosocial and socioeconomic status of clients are mentioned as part of competencies for entry level dietitians in Canada (Dietitians of Canada, 1996) competencies relating to environmental risk conditions is limited. Strategies to improve confidence of dietitians in their ability to address psychosocial and risk conditions should include skill development in these areas. For example, dietitians would benefit from skill development in developing support groups, working with community partners and building healthy public policy.

3.4.1 Limitations

With regards to limitations, there could be a response bias with participants completing the on-line survey being those with more knowledge or understanding of health promotion. However it was doubtful that there was a social desirability bias, where the informants might have a tendency to report positive findings or state they engage in heart health promotion activities since it is perceived as the 'right thing to do' since participants rated their involvement as low. The survey was limited to dietitians' perceptions of health promotion without corroborating evidence such as a document review of programs dietitians are involved in. However a recent systematic review of studies that examined the relationship between intention and clinical behaviors of health professionals, found there is a statistically significant correlation between the self-reported intentions of a health professional and their behavior (Eccles, 2006). Thus self-reported behaviors or practices can be useful proxies for measuring actual behavior (Eccles, 2006).

As with all studies, there are limits to the generalizability of the findings. The qualitative findings from this study can be generalized to an understanding of dietitians use of health promotion to those working in a regionalized health care system. Similarly, the quantitative findings can be generalized to other dietitian populations with similar characteristics (Horsburgh, 2003).

3.4.2 Conclusion

To the best of our knowledge this is the first study to investigate dietitians' perceptions, knowledge and practice regarding health promotion and the broader determinants of health. Dietitians are being exhorted to take on a health-promotion role and are considered by many to be in an excellent position to do so. It is therefore important to consider how health promotion can be incorporated into dietetic practice.

This study suggests that despite the shift in focus of heart health promotion from attempting to change individual behavior (in the 1980s and early 1990s) to the acknowledgement of wide influence on health (in the late 1990s), individual responsibility for heart health remain the main area of focus for dietitians. Although supportive environmental changes are as important as individual behavior change efforts in improving the health of a population, dietitians have limited understanding and involvement in addressing environmental risk conditions for cardiovascular disease.

Decision-making on the implementation of heart health promotion into practice is a complex phenomenon that depends on a variety of factors that relate to the individual, dietetic environment and institutional policies. Dietitians are in a key position to make decisions, and it is important for dietitians to consider the impact of their own views and perceptions regarding heart health promotion activities. Although dietitians working at the management level had a better knowledge and understanding of health promotion concepts and had stronger belief that risk conditions comprising health promotion should be addressed, implementation remained low. More research is needed on effective methods for the dissemination, uptake and diffusion of health promotion concepts in dietetic practice.

Table 3.1 Demographic characteristics of heart health dietitians participating in focus groups, n= 20

Item	**Frequency** Count (%)
No. of years in practice	
< 5 years	4 (20 %)
5 – 10 years	5 (25 %)
10 – 20 years	4 (20 %)
> 20 years	7 (35 %)
Education	
Bachelors	18 (90 %)
Masters	2 (10 %)
Type of practice	
Primary Care (community and out-patients)	3 (15 %)
Secondary (rehabilitation)	5 (25 %
Tertiary (acute care, in-patients)	4 (20 %)
Regional Mandate	8 (40 %)

Table 3.2 Themes that emerged from focus groups regarding dietitians' perceptions of heart health promotion, n=20

Health promotion means focusing on the individual
-healthy lifestyle approach (diet, activity, smoking)
-providing education (information/resources) with consistent messages
-setting realistic goals based on stages of change
-development of personal skills
-individual 'empowerment' (for self-directed promotion of heart health)
-personal responsibility for health
Health promotion means a population focus
-target vulnerable groups
-strengthen community action
-using media and internet for advocacy
-public policy and environmental change

Table 3.3 Demographic characteristics of heart health dietitians surveyed (n = 51)

Item	Value (range)
No. of patients for cardiovascular disease risk modification seen per week	9 ± 10.7patients/ week
No. of years in practice	10 ± 7.5 years (0.5 – 27 years)
Education	
Bachelors	94 %
Masters	6 %
Type of practice	
Primary Care (community and out-patients)	42 %
Secondary (rehabilitation)	7 %
Tertiary (acute care, in-patients)	28 %
Regional Mandate	23 %
Location of practice	
Chinook Regional Health Authority	10 %
Palliser Health region	6%
Calgary Health region	8 %
David Thompson Regional Health Authority	21%
East Central Health region	6%
Capital Health	14 %
Aspen Regional Health Authority	10 %
Peace Country Health	14 %
Northern Lights Health region	6%
Lifestyle	
BMI (average)	22.8 ± 2.4 kg/m2 (18 – 27 kg/m2)
Non – smoker	100%
No. days per week physically active	4 ± 1.8 days /week (1 – 7 days/week)
Amount of time physically active	45 ± 20 minutes/day (15 – 120 mins/d)
Average number of servings of vegetables and fruit per day	5.8 ± 1.4 servings /day (4 – 8 servings/d)
Frequency of use of information	
Canadian Recommendations for Management of Dyslipidemia (CMAJ, 2003)	74 %*
American Heart Association Population based guidelines at the Community level, 2003	18 %

Data are presented as mean ± SD for continuous variables and frequency (%) for categorical variables.

* Percent reporting using the guideline 'often' or 'regularly'

Table 3.4. Dietitians' knowledge, belief, confidence and frequency in addressing factors and conditions that contribute to cardiovascular disease.

Item	Knowledge*	Belief**	Confidence†	Frequency‡
Physiological				
blood pressure	4.12 ± 0.72	4.78± 0.46	4.24 ± 0.66	4.38 ± 0.70
cholesterol	4.46 ± 0.61	4.94± 0.24	4.60 ± 0.53	4.80 ± 0.40
obesity	4.34 ± 0.56	4.98± 0.14	4.42 ± 0.61	4.72 ± 0.50
genetic	3.74 ± 0.92	3.33± 0.98	3.47 ± 0.14	3.74 ± 1.16
mean	4.17 ± 0.59[a]	4.65± 0.32[a]	4.19 ± 0.54[a]	4.41 ± 0.49[a]
Behavioral				
smoking	3.82 ± 0.85	4.28 ± 0.83	3.40 ± 1.03	3.96 ± 1.05
poor diet	4.64 ± 0.53	4.94 ± 0.24	4.76 ± 0.48	4.88 ± 0.39
inactivity	4.38 ± 0.64	4.82 ± 0.39	4.28 ± 0.67	4.70 ± 0.51
mean	4.28± 0.53[a]	4.68 ± 0.36[a]	4.14 ± 0.54[a]	4.50 ± 0.46[a]
Psychosocial				
social support	3.30 ± 1.05	3.88 ± 0.66	2.88 ± 1.02	2.88 ± 0.98
stress	3.36 ± 0.90	3.96 ± 0.78	3.12 ± 0.86	3.22 ± 0.97
low self-esteem	2.88 ± 1.02	3.46 ± 0.79	2.50 ± 1.02	2.18± 1.00
socioeconomic	3.26 ± 1.03	3.71 ± 0.76	2.47 ± 1.08	2.48 ± 1.01
mean	3.20 ± 0.90[b]	3.75 ± 0.62[b]	2.76 ± 0.84[b]	2.69 ± 0.79[b]
Environmental				
poverty	3.26 ± 1.05	3.52 ± 0.86	2.38 ± 1.07	2.38 ± 1.14
work	2.80 ± 1.14	3.18 ± 0.85	2.16 ± 1.02	1.92 ± 1.00
discrimination	2.32 ± 1.11	2.90 ± 0.86	1.90 ± 0.89	1.58 ± 0.97
income gaps	2.84 ± 1.08	2.88 ± 0.94	2.06 ± 1.04	1.60 ± 0.99
mean	2.79 ± 0.99[c]	3.15 ± 0.78[c]	2.13 ± 0.94[c]	1.87 ± 0.92[c]

Values with a different lettered superscript (i.e. a,b,c) in a given column are statistically significant from each other $p < 0.005$ (see Table 3.5 for details).

*respondents indicated their current level of knowledge of factors and conditions contributing to heart disease, as it relates to dietetic practice and heart disease, 1= no level of knowledge, 2=a little level of knowledge, 3 = some level of knowledge, 4 = moderate level of knowledge, 5 = a lot of level of knowledge.

** Respondents indicated their current level of belief that risk factors and conditions that contribute to heart disease should be addressed in dietetic practice for heart disease. 1= Strongly Disagree should not be addressed, 2= disagree, 3= neutral, 4 = agree, 5 = strongly agree should be addressed.

†Respondents rated their confidence in addressing risk factors and conditions for heart disease in their practice. 1 = not at all confident, 3 = moderately confident, 5 = extremely confident.

‡Respondents rated their frequency in addressing risk factors and conditions for heart disease in their practice. 1 = never addressed, 2 = seldom addressed, 3 = occasionally addressed, 4 = often addressed, 5 = always addressed.

Table 3.5. One-way analysis of variance for comparison of risk factor categories

Comparison	Ph Mean (SD)	B Mean (SD)	P Mean (SD)	E Mean (SD)	F	p-value	Eta squared	Post Hoc p value
Knowledge								
Mean	4.17	4.28	3.20	2.79	71.66	0.0001	0.824	Ph vs. B p= 0.317
	(0.59)	(0.320	(0.90)	(0.99)				Ph vs P p = 0.0001 Ph vs E p = 0.0001 B vs. P p = 0.0001 B vs E p = 0.0001 P vs. E p = 0.0001
Belief								
Mean	4.65	4.68	3.75	3.15	78.874	0.0001	0.837	Ph vs. B p= 1.000
	(0.32)	(0.36)	(0.62)	(0.78)				Ph vs P p = 0.0001 Ph vs E p = 0.0001 B vs. P p = 0.0001 B vs E p = 0.0001 P vs. E p = 0.0001
Confidence								
Mean	4.19	4.14	2.76	2.13	77.527	0.0001	0.847	Ph vs. B p= 1.000
	(0.54)	(0.54)	(0.84)	(0.94)				Ph vs P p = 0.0001 Ph vs E p = 0.0001 B vs. P p = 0.0001 B vs E p = 0.0001 P vs. E p = 0.0001
Frequency								
Mean	4.41	4.50	2.69	1.87	147.656	0.0001	0.906	Ph vs. B p= 0.426
	(0.49)	(0.46)	(0.79)	(0.92)				Ph vs P p = 0.0001 Ph vs E p = 0.0001 B vs. P p = 0.0001 B vs E p = 0.0001 P vs. E p = 0.0001

Ph= Physiological, B = Behavioral, P= Psychosocial, E = Environmental Risk Factors

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CHAPTER 4. HOW DIETITIANS UTILIZE HEART HEALTH NUTRITION EVIDENCE AND GUIDELINES IN PRACTICE.

4.1 Background

The leading cause of death in Canada continues to be cardiovascular disease (CVD) with 36% of deaths due to CVD (Heart and Stroke Foundation, 2003). Although the scientific basis for cardiovascular disease prevention is among the best for any current clinical field, there remains a gap in translating this research into practice (McClaren, 2001). A gap refers to a discrepancy between the processes of care that have been defined as best practice on the basis of high-quality evidence and the care provided in usual practice (Majumdar, 2004).

The view that health professionals will understand and embrace evidence-based innovations to improve service/client care may not necessarily hold true in practice. Since one of the main barriers to prevention is inadequate implementation of already proven interventions (Majumdar, 2001), research efforts in evidence-based preventive practice should be complemented by research into how to implement this evidence in practice (Grol, 1997).

Specifically, there is need for research into how nutrition research and knowledge can influence the behavior of health professionals. Most studies regarding research use have been done in nursing and medicine. Professions differ from each other in terms of education requirements, practice patterns, autonomy of treatment and research foundations all of which could alter patterns of research use (Pain, 2003). For example in nurses, lack of authority to change patient care procedures has been reported to be one of the primary barriers to using research findings in practice (Funk, 1991), whereas rehabilitation therapists are more concerned with lack of time to read and implement ideas (Closs and Lewin, 1998).

Physicians have been found to have difficulty meeting the standards recommended in major clinical practice guidelines, and only half of physicians routinely advise people who smoke to quit, only a third of patients who need treatment for high blood cholesterol receive it (McClaren, 2001) and only a third of overweight patients were advised to lose weight (Heath, 1993). A study of lipid-lowering management across two different physician practice settings concluded that the variation in practice was attributable to individual physician behavior, despite clear protocols for intervention (Harnick, 1998). Potential barriers for physician guideline adherence have been summarized into three areas, as knowledge, attitude and behavior (Cabana, 1999). Physician knowledge of guidelines may be limited by the volume of information, lack of time and accessibility; disagreement with guideline recommendations, poor expectations of efficacy; and behavior may be affected by the complexity of recommendations, the patient's attitude, organizational and fiscal constraints. Cabana (Cabana, 1999) also references other factors that affect physician behavior, these include the credibility of the organization producing the guidelines, the involvement of the practitioners in adapting the guideline to the clinical setting, continuing education, practice setting, systems in place that support practice compliance, and systems that monitor guideline use such as audit and feedback.

There has been little research on dietitians relating to translation of research into practice. Research has been done on dietitians regarding their involvement in the research process (Slawson, 2000). Wammes and colleagues (2002) report on factors influencing dietitians to develop dietetic guidelines. Dietitians' knowledge, attitude and practices regarding evidence-based practice were investigated in general (Byham-Gray 2005), in pediatric dietitians (Thomas, 2003), and in renal dietitians (Burrowes, 2005). However the studies do not provide information on how dietitians implement research findings in their practice, and the contextual factors associated with guideline implementation.

The rationale for the research is found in Rogers' Diffusion of Innovations theory. Rogers (Rogers, 1995) suggests an individual may need to progress through a number of stages before the actual change occurs. These stages include: a) knowledge, b) persuasion, c) decision, d) implementation and e) confirmation. In order for a person to

change, the individual must first be aware of the new knowledge that is persuasive enough to warrant deciding to change behavior or practice. During the persuasion stage, five attributes of the innovation: relative advantage, compatibility, complexity, trialability and observability are considered (Rogers, 1995). However, innovations are not always adopted and implemented, even when the innovation has obvious and proven advantages. Therefore, it is important to explore factors that facilitate or hinder the process of behavioural change.

It is also important to understand the context in which individual practitioners make decisions, since many decisions regarding practice are increasingly being made or constrained at the institutional level (Kanouse, 1988). Grol (Grol, 1997) recommends that after a proposal is developed for changing practice, obstacles to change at the individual, social and organizational level should be identified. Examples of factors that can be barriers to change include reactions from patients, colleagues, lack of resources, organizational climate, and authority and decision making structures (Grol, 1997).

Although considerable time and resources are spent in dissemination strategies such as publishing journal articles, continuing education programs, manuals and tool kits, very little has been established as to facilitate research use. This study proposes to explore dietitians' experiences and perceptions of incorporating nutrition research within their practice. In particular we sought to identify: 1) How dietitians use research in their practice?; 2) What sources of evidence do dietitians use in their practice?; 3) What is the estimated level of guideline implementation in dietitians' practices?, 4) What contextual factors do dietitians perceive as facilitators or barriers for research implementation?; 5) What strategies can improve dietitians' use of evidence in practice?

4.2 Methods

Due to the lack of literature concerning barriers/facilitators for dietitians to implement heart health research into practice, this research is exploratory and best suited a mixed methods approach that includes qualitative and quantitative methods. Focus groups were

selected for this study because they allow participants to share their clinical experiences with their peers, and can reveal differences and similarities within groups. To complement the qualitative data regarding putting nutrition evidence into practice, a quantitative survey was done to assess dietitians' knowledge of dyslipidemia guidelines, and their facilitators and barriers to implementation of the guideline in practice.

4.2.1 Sampling

A purposive sample occurred with dietitians that work in the area of heart health in Edmonton, which includes cardiology, diabetes, outpatients and community settings. A purposeful sample is one in which participants are actively sought out and chosen for a study due to their situational 'fit' in an exploratory study (Fetterman, 1989). Purposive sampling is necessary to ensure participants know as much as possible about the topic under study (Fetterman, 1989). Since the primary researcher (CW) was on leave from a dietitian management position in a regional health authority, participants were recruited by a third party to avoid putting colleagues in a potentially compromising situation regarding their participation in the study. Potential focus group participants were sent an invitation to participate by an electronically mailed message from a clerical staff member from that region. Dietitians were recruited until saturation (Sobal, 2001) where no new themes emerged from the focus groups. Before the beginning of each focus group, participants were informed that each session would be audio-taped and transcribed and their responses would be coded anonymously. Participants were provided with an information letter and signed informed consent was obtained from all participants (see Appendix 1).

For the quantitative data collection, clinical dietitian leads in each health region in Alberta were contacted about participation in the study. In 2004, an e-mail explaining the purpose of the survey and the indication that all responses were anonymous and confidential was sent to the clinical leads with a link for completing the on-line survey. Clinical leads in each health region forwarded the e-mail consent letter with a web-based survey link to dietitians working in their region in the area of heart health, and indicated the number of dietitians the survey was sent to. A follow-up e-mail was sent to dietitian

leads asking them to remind participants to complete the survey. Informed consent was implied when participants completed the survey.

Ethical approval was obtained from the Health Research Ethics Board of the University of Alberta, Capital Health, and Caritas Health Group (Appendix 1).

4.2.2 Data Collection

Focus groups were conducted from November 2002 to February 2003. A trained facilitator conducted the focus groups in which dietitians were asked to describe how they used research and/or nutrition evidence in providing nutrition care for the last patient with cardiovascular disease and/or risk factors they saw, a patient that presented with an unusual condition or unusual challenges, and the last time they changed work areas (Table 4.1). Community dietitians and administrative dietitians described the most recent program relating to cardiovascular disease they were involved with, an unusual or challenging program, and the last time they changed work area. This is adapted from questions used by Pain and colleagues (2004) in their study of research utilization by rehabilitation professionals. Discussion also took place about facilitators, barriers and strategies to dyslipidemia guideline implementation in practice. Notes were taken at all focus groups and were tape-recorded as a means of verifying and augmenting themes. Focus group participants completed a questionnaire to validate the themes (Appendix 3).

The survey instrument (Appendix 2) was developed from themes identified in the focus groups, and literature on research and guidelines utilization in practice. Respondents indicated the extent of their agreement with statements on a five-point Likert scale, where response options ranged from strongly disagree=1, to strongly agree=5. Demographic variables were collected including area of practice, years in practice, level of education and information on personal health behaviors regarding smoking, diet and activity. The questionnaire was reviewed and pilot tested by dietitians and researchers (n=12) regarding clarity, content, and time for completion (see section 3.2.4).

4.2.3 Data Analysis

Qualitative text analysis of both the focus group and interview transcripts were conducted to identify the competencies, barriers and facilitators described within the interview data using a phenomenological approach. In this approach, each data cluster was analyzed to consider the relevance, how the information was typified, and impact on the participant's everyday reality (Rothe, 2000).

More specifically, data collection and data analysis were carried out in parallel and started at the first focus group session. Interviews were transcribed verbatim and read through line by line in order to develop a sensitivity to the content of the data. The data were first coded by capturing the substance of the data and breaking it up into smaller segments through identifying and joining together substantive codes or concepts into categories. The first step means that emerging concepts were verified and saturated in the new data. In the second step, specific categories or concepts were focused upon as well as possible relations between categories and their subcategories. The data were then combined together into a larger whole by associations between the categories and their subcategories.

Rigor in qualitative research is demonstrated through accurately representing study participants' experiences, this is done through ensuring credibility and transferability (Streubert, 1999). In the current study, peer debriefing occurred where findings were discussed with colleagues who were knowledgeable about the phenomena to explore alternative explanations. This helped ensure transferability or the probability that the study findings have meaning to others in similar situations. This process helps prevent biases the researcher may develop and to explore alternative explanations for findings. To confirm credibility of findings is to see whether the participants recognize the findings to be true to their experience. This has been called 'member or participant-checking' (Giacomini, 2000) and it was used where the summary of the final categories and themes were sent to participants via e-mail to validate the findings and see if they are representative of their experience. Thirteen of the twenty participants responded to the

request for feedback regarding the results. There was 90% agreement with themes, with a range in agreement from 60% to 100% (see Appendix 3).

For the survey, data were compiled on-line using Zoomerang™, a web-based survey tool, downloaded to an Excel spreadsheet. Statistical analyses were performed using the Statistical Program for the Social Sciences (Windows version 12, 2005, SPSS, Inc, Chicago, IL). Descriptive statistics were generated for all reported measures. Frequency distributions were generated for all study questions and open-ended responses were summarized. Data were summarized as means for continuous data, counts and percentages for categorical data.

Contingency table analysis was used to evaluate if there were significant differences between frequencies of response to variables across the categories of the variables (i.e. dietitian's type of practice, primary, tertiary, management). For significant chi square correlations between categories, $p < 0.05$, the strength of the relationships were evaluated using Cramer's V.

4.3 Results

Of the 30 dietitians working in heart health related areas at both the provider and management level, 20 participated in 4 focus groups (Table 4.2). Three focus groups (n=3, 4, 5) consisted of dietitians working at various provider levels including primary (1°) or ambulatory care, secondary care (2°) such as cardiac rehabilitation, and tertiary care (3°) in acute care cardiology and transplant. One focus group (n=8) consisted of management (M) with both clinical and community responsibility towards heart health across the region. The themes that emerged from the focus groups regarding dietitians perceptions of research use and facilitators and barriers to use of guidelines in practice are summarized in Table 4.3 and Table 4.4 respectively.

The survey was distributed by the 9 clinical leads in each of the 9 health regions to 135 dietitians across Alberta. There were 51 respondents resulting in a response rate of 34 %.

Table 4.5 contains demographic characteristics of the sample population. Respondents were from all health regions, who counseled an average of 9 patients per week regarding cardiovascular disease, and had been in practice for a mean of 10 years, ranging from 0.5 to 27 years. Six percent had a Masters degree with the majority of respondents (94%) having a bachelor's degree. Close to half of respondents (42%) worked in primary care and one-third (28%) worked in tertiary care with 23% having a regional mandate. All respondents reported healthy lifestyles with 100% of respondents being non-smoking, consuming on average 5.8 servings of vegetables and fruits per day (range 4 – 8 servings/day), with a mean BMI of 22.8 kg/m^2. Respondents reported being active on an average of 4 days/week (with a range from 1 day to 7 days), and being active on average 45 minutes/day (with a range from 15 minutes to 120 minutes).

4.3.1 How dietitians use research in practice

Dietitians shared many examples of using research to support the content of their intervention. Content refers to nutrition specific advice and recommendations they give patients that is based on the literature.

> "He's a fellow who came in with a diagnosis of congestive heart failure and he had a heart attack at the same time he was having an angiogram. So he just had a MI and does have significant coronary artery disease. He's quite receptive to making food changes in our initial classes so we started talking about sodium and talked about the DASH (Dietary Approach to Stop Hypertension) diet in his case because he did have hypertension too. I went through the DASH diet. Talked about grapefruit juice and he takes Zocor so no grapefruit/juice. I then referred to the Heart Protection Study, he wanted to use supplements and was taking vitamin E 400 IU, and its not recommended for use now especially if you take Zocor it can lower your HDL. I tell him that the Heart Protection Study had 40,000 people in it, and they didn't get a benefit from taking Vitamin E." (2°)

> "I had a call from a patient . . . [who] heard about the Atkin's diet. So I phoned my [colleague] who directed me to the American Heart Association . . and there was a reference to a beautiful critique in Circulation [Journal]."(3°)

Dietitians also discussed the process of providing care. Other than a few sharing their experience and challenges faced with implementing the American Dietetic Association's Medical Nutrition Therapy (MNT) protocols, research evidence was not mentioned as a rationale for program design and delivery. Rather the process of providing nutritional care is based on usual and historical practice.

Medical Nutrition Therapy (MNT) is defined as a plan or set of steps, developed through a consultative process by a Registered Dietitian, which incorporates current professional knowledge and research, and clearly defines, in addition to the content of nutrition care, the process and frequency of nutrition care that is appropriate for a disease or condition (American Dietetic Association, 2006). Medical Nutrition Therapy begins with the nutritional assessment of a client, followed by a medically prescribed nutrition therapy based on standard protocols (American Dietetic Association, 2006).

> "We have a very structured program. We see them individually in the hospital and when they come for the [outpatient] class we see them at least twice after that because they are on an exercise program. So we see them over a three-month period and then we see them again at one year. So. . . it's pretty set in terms of when we see them." (2°)

> "All my patients are inpatients so the time and amount that they can absorb and the amount of them really being interested in listening is different than an outpatient setting. We teach a general class. We can work in one-on-one counseling and sometimes we do. But it really does limit what we can tell them in the sense that you come out with very little and trying to [determine] where it would affect them the most." (3°)

> "I wanted to do heart healthy classes so they [patients] could have a group approach and so its just easier for me. They gain support from each other with the whole aspect of dealing with the illness." (2°)

> "I can't follow the MNT guidelines [in regards to number of visits] due to time constraints, but I use it [as a reminder] for which topics to discuss." (1°)

> "We implemented [the MNT protocol for dyslipidemia] and there were a lot of challenges for that with communication, getting physicians on board and supporting it because we wanted more lab values." (M)

The above quotes indicate a difference between management and provider level dietitians in their success at implementing evidence, such as the MNT protocols, in practice. Dietitians indicated that research is used in combination with context to make decisions. Context included patient's clinical situation and their goals as well as the dietitian's philosophy towards patient care and time constraints.

> "When I look at a patient and decide what to do it's based on a discussion with the patient and their motivation and desire to make changes. So although we start with a very structured handout which is evidence based, it really is patient guided because if the patient doesn't buy into it you're not going to get anywhere." (3°)

> "You have to be aware of where your patient is coming from in order to [suggest] an appropriate intervention. . . this individual who was coming to see [me] was a fairly young person, he was in his mid-thirties, he had a MI, but he had extremely high lipids, high triglyercides and high cholesterol on a maximum dosage of medication, but still not controlled. He had xanthomas throughout his body, on his hands, so he was extremely high risk and his whole family had this family history of having high lipids. . . he did abuse alcohol so with the triglycerides we talked about that . . it was his major [modifiable] risk factor." (2°)

Dietitians reported using research to develop patient education materials and recognized there can be disagreement on interpretation of research evidence amongst dietitians.

> "We update them [patient education handouts] 2-3 times a year based on information in the research, so I would say its very research based." (2°)

> "We brought dietitians working in different areas from cardiac rehab to hyperlipidemia programs, together to come to agreement on what education resources were needed and the content. There was a lot of difficulty in coming to agreement among the dietitians. Some was a philosophical /value difference. Some thought we need to have a strict diet and were teaching more rigid diets, whereas others were much more flexible in their teaching." (M)

Dietitians were less likely to report using research to prepare them for a change in work areas, and instead relied on discussion with colleagues, diet manuals and textbooks as a source of evidence.

> "I talk to other dietitians that have been in the area" (1°, 2°)

> "I definitely go back to the DC/ADA manual, I always look in that one because it has all the really good information I need"(1°, 2°)

> "When I first started this it was a new position for me so I had to even review my basic physiology and you know the stuff you learn in University." (3°)

Dietitians were less likely to report using research when faced with an unusual patient or novel therapy and instead used other information sources such as discussion with colleagues or searching the internet.

> "It's [doing a literature search] more time consuming with an unusual condition. . . And you got to see them and make a decision by the end of the day as to how you are going to handle them so you can't necessarily read ten articles to decide what you're going to do." (2°)

> "I usually talk with the physician about the medical problem if I'm not familiar with it and find out what the goals are specifically from the medical staff." (3°)

> "Patient started coming off the [street] drugs he started putting on weight. A massive amount of weight and I couldn't figure out why. So consulted the physicians and we found out he had Klinefelter's disease. I didn't know what that was . . . so I had to look it up . . . onto the internet and do a bit of searching as well just to type in whatever and see what comes up." (1°)

> "Sometimes I just go onto the internet to do a . . . general search to see what people are hearing out there. The most we use it [general internet search] for is the unusual intakes [diet supplements] people have." (1,2,3°)

The observation by a dietitian that having to make a clinical decision within a set time limits the use of research, is similar to findings with physicians where the time to conduct a MEDLINE search is seen as too lengthy for point-of-care searching (Alper, 2005).

Dietitians at the management level mentioned gaps in the literature where research does not exist regarding aspects of nutritional intervention.

> "A lot of work in 'research' settings may not be applicable to practice, little research on actual impact a dietitian teaching about nutrition has on that person's risk for heart disease." (M)

> "There is some evidence in the research about dietitians reducing the need for medication . . [but] there haven't been many studies really." (M)

Clinical dietitians mentioned that in the absence of research, extrapolation for specific populations, ages (pediatrics) and gender and clinical judgment is used. Extrapolation is an estimate and extends what is known about nutrition intervention in one area to another.

> "She came in and she had cardiac disease and it wasn't related to dyslipidemia, but more to arrhythmias and hyperkalemia. And there were [research] articles on pregnancy and heart disease, but there wasn't a lot on nutrition. . . so you're sort of flying by the seat of your pants and trying to determine clinically exactly what you should do." (3°)

> "My background has to do with pediatrics and renal disease and transplant . . . have to extrapolate the literature and diet practice guidelines into those groups." (3°)

> "I had to extrapolate from [research on] men to women and that's the bigger issue." (3°)

Dietitians working at the management level and in tertiary care mentioned using benchmarking in absence of research, to generate evidence. Benchmarking is an inter-comparison method often used in business whereby an organization measures its performance or process against other organization's best practices, determines how those organizations achieve their performance levels, and uses the information to improve its own performance. (Six Sigma, 2003)

> "We look at what is done at different centers throughout Canada and in the states." (M)

> "We look at previous Canadian Heart Health projects and others around the world that have similar successful programs (supporting the benefit of lifestyle changes) in their practices." (M)

> "In my case there was nothing [few literature papers] and so it was more benchmarking and that's what we tried to do at this center." (3°)

Dietitians mentioned involvement in research-related activities such as supervision of student dietitian research projects or data collection facilitated research use. This finding is similar to findings by other researchers (Bostrom, 1993) where participation in research projects facilitated implementation of research findings in practice.

"I'm very interested in research . . . we've had several intern projects recently and we have been involved in research that the cardiologist is doing as well. I think once you're interested in research it becomes a part of your job." (2°)

4.3.2 What sources of knowledge do dietitians use in their practice

Discussion with colleagues

"I talk to other dietitians that have worked in the area when I have questions." (2°)

"We have cardiologists who are very .. . I'd say obsessed with diet. So we constantly get articles." (3°)

"I have very few patients that come in with just one thing so we do look at other aspects of nutrition besides cardiology. And the advantage that I have is that as a team, . . and if a nurse goes to a conference she brings me diet information, so it's easier to get caught up in terms of the cardiac area." (2°)

Review articles and manuals

"Because I don't only do heart health and can't just focus my reading on one area, so I use the Dietitian manual [ADA/DC Diet manual]." (1°)

"I do glance at review articles, those are something that gives you an overall feeling and then you can go back to the articles that it's coming from." (3°)

"I read more reviews and am not into reading the randomized controlled trials . . . because I'm not as familiar with all the methods." (2°)

In one of the focus groups, participants indicated attendance at specialized nutrition conferences as being a source of information on heart health research. Studies in nursing have reported significant relationships between use of nursing practice innovations and attendance at research conferences (Michel and Sneed, 1995).

"You look to the Canadian Cardiovascular Society for knowledge of other aspects related to heart disease [such as] medication . . . but there is very little on nutrition. Dietitians of Canada has the cardiology network [which has] a one-day conference that's usually prior to the full conference and they have some really specific things which is great." (3°)

One of the dietitians mentioned obtaining research information from an industry's nutritional representative.

> "I got interested in flax and one day I called the Flax Council and she [the dietitian] was really helpful in giving me an overview so I didn't have to go through all the readings." (2°)

As indicated in Table 4.6, the top sources of research information for dietitians surveyed was discussion with colleagues and review articles, with 74% of dietitians indicating that discussion with colleagues occurs on an "often or always" basis, and 70% of dietitians indicating that review articles are read "often or always." Following dyslipidemia guideline as an information source, dietitians used textbooks and manuals including the Manual of Clinical Dietetics (American Dietetic Association and Dietitians of Canada, 2000). Only half of dietitians indicated they referred to original research articles (clinical trials) on a regular basis.

General internet and web-based information was used more frequently as an information source for dietitians working in primary care (44%), and regionally (38%) as compared with those working in more specialized areas such as cardiac rehabilitation (25%) and tertiary care (19%).

As indicated in Table 4.6, there were differences in dietitians use of information depending on their type of practice. In particular, dietitians working at the management level reported discussion with dietitian colleagues less frequently than dietitians working in primary or tertiary care (χ^2 =10.67, $p \leq 0.03$). Likewise management dietitians reported using original research articles such as clinical trials less often than primary or tertiary care dietitians (χ^2=9.73, $p \leq 0.045$). In contrast tertiary dietitians use general internet and web-based information as a source of information less often than management or primary care dietitians (χ^2=15.71, $p \leq 0.003$).

4.3.3 Use of Canadian dyslipidemia guideline by dietitians

All of the dietitians in the focus groups indicated they were aware of the Canadian Recommendations for Management and Treatment of Dyslipidemia (Genest, 2003). Results of the survey indicate more than three-quarters of dietitians (78%) agreed they were using the Canadian Recommendations for Management and Treatment of Dyslipidemia (Genest, 2003) on a regular basis. Dietitians reported using the guideline in their practice to change counseling practice (82%), revise education resource materials (69%), and promote the guideline to others (66%). However, few dietitians had used the guidelines to change policies and procedures (36%).

Seventy-six percent of respondents correctly indicated that in patients at high risk for cardiovascular disease, medication and lifestyle changes are started immediately. Whereas only 46% correctly indicated in patients at moderate risk for cardiovascular disease, diet and lifestyle changes are tried for three months before medication is started. Almost all dietitians (98%) conducted a diet history on an "often or always" basis, and although 80% calculated BMI, only 62% weighed patients and only 17% measured waist circumference often or always. One third (34%) of respondents indicated cardiovascular disease risk was calculated often or always.

Similar to information sources, most respondents first learned about the guideline from discussion with colleagues, and/while others learned about the guideline from reading the published article in a medical journal. Very few learned about the guideline via an on-line resource or press release.

There was strong agreement (mean score of 4.1 to 4.5 on a five point scale ranging from strongly disagree to strongly agree) that the guideline is important, credible, relevant and reliable, with slightly less agreement that the guideline is simple to understand and makes current practice effective, with a mean score 3.9 and 3.8 respectively. There was less agreement, with a mean score of 3.6, that evidence regarding the impact of guidelines on practice is available.

4.3.4 Barriers and facilitators to use of guidelines by dietitians

What helps dietitians apply guidelines

Many dietitians mentioned involvement of colleagues, including families, and showing beneficial outcomes as helping them apply the guidelines in practice.

> "Team member help in applying the recommendations because they identify patients that need help to participate in educating the patients." (1°, 2°)

> "We can incorporate the families . . . the program has a family support group and I've been involved in that." (2°)

> "Because dietary recommendations are usually the first step .. . there is the potential for showing a measurable outcome in that you can show a change in lipid values, weight, blood pressure, also change in self-perception and allowing people to take more of a realistic control over their own health issues." (M)

Other dietitians indicated knowledge and education about the guidelines is needed, but just having the guideline is not enough, tools and education resources are needed to implement guidelines.

> "They actually need to look at it and get a copy and read to absorb the information . . . but they need the time to be able to do that and maybe even education opportunities to learn more about these guidelines." (M)

> "Having teaching resources available that go with the guidelines." (1°, 2°, M, 3°)

> "Knowing community resources that are available to patients." (1°)

What prevents dietitians from applying guidelines

Many dietitians mentioned the patient's context as a barrier to guideline implementation.

> "Patient barriers . . literacy, physical barriers, economic status, age, living arrangements, social barriers, and . . . patient's stage of change, some of them are just there because they have to be there and they don't care . . . and not willing to listen to any recommendation." (2°)

> "Alertness of the patient because we find they go through so many tests that when they actually do come to a class or anything they're just exhausted and sleep through it." (1°, 3°)

"We're also combating the amount of information that patients pick up from the internet . . .like on soy or the Atkins diet . . and then we're left struggling to prove our credibility." (3°)

"It's a low income area and a multicultural area so you know I'm trying to get people to have 5-10 fruit and vegetables and there's some that can't afford that." (1°)

Other dietitians indicated a barrier to implementing the guidelines in their practice was that the guidelines were too general and not specific enough to nutrition.

"These particular guidelines, they're so general and they're so medical based that they're really not dietitian guidelines . . . we've had problems with everybody taking those guidelines and interpreting them the way they see . . . and then you have twenty different people doing twenty different things." (3°, M)

"I think the bottom line is that we need Canadian dietary guidelines." (M)

A number of dietitians wanted more consistency in application of the guidelines. Consistency is needed between guidelines, and amongst physicians and dietitians regarding application of the guidelines.

"More consistency with the doctors because some doctors will put all diabetics on Lipitor because they are at great risk for heart disease, while others won't." (1°)

"Inconsistent message because I know one man was arguing with me that my doctor said I could have four eggs and our guidelines are two egg yolks." (2°)

"We have some very strong minded cardiologists and they don't necessarily agree with each other which is an issue. . . we come in and there's a Mediterranean diet [request] . . . they thought 5 fruits and vegetables were too much because patients would gain weight." (3°)

"We looked at the [Canadian Recommendations for Management of Dyslipidemia] the American Heart Association one that was just published and the MNT protocol as well as the American Dietetic Association/ Dietitians of Canada manual. There are no definitive terms in what you should teach and how you should teach, so there was still some flexibility amongst the guidelines. But with something like ATP-III at least there was a lot more agreement on how many eggs and how much cholesterol and so on, so at least you're working towards the same aim and goal." (M)

Some dietitians mentioned a barrier to guideline implementation was lack of physician referral due to lack of knowledge and access to diet counseling, the assumption that patients had already received diet counseling, and use of medications instead of nutritional therapy as a primary treatment.

> "Often times it's one doctor that provides us with three quarters of our referrals so obviously he hasn't got all the people with high cholesterol in the whole city, and so other doctors aren't referring . . .obviously he knows about the service . . but that means there's a whole lot of people that are not being provided with the opportunity to come to education." (2°)

> "[Physicians] don't refer to you because they think this patient has already had diet teaching." (2°)

> "Implementation of MNT protocols. . . it was sometimes difficult to get the physicians to buy in and to meet the protocol appropriately as a first line of therapy." (M)

Many dietitians mentioned the lack of dietitians and inability to provide follow-up sessions with patients was a barrier to guideline implementation.

> "[Lack of] support for dietitians working in the community . . . there is lack of staffing." (M)

> "We need more ambulatory care dietitians in the region." (2°)

> "If you want to see a private dietitian you have to pay and [I] think that's a big deterrent." (3°)

> "Follow-up and length of turnover time so we might not even actually see them." (2°)

> "Have the kind of lipid class for people who have not had MI s . . . . and there's no follow-up for them so they attend the class once and neither [dietitian] really follow up with them so they don't know if they've actually made changes." (1°)

> "Usually they [dietitian] only get one time with a person, and so with that one time appointment . . the dietitian has to get them so motivated that they're going to make a lifestyle change. .. but where you can't do proper follow-up and tracking because you're only going to see them once you're not going to get them to change." (M)

> "We don't have any funding for primary intervention in terms of where nutrition is involved, and if you look at the cost differences of medication versus actually just basic healthy eating and changes in lifestyle and behavior." (M)

One inpatient dietitian mentioned the cardiac menu patients received in the hospital did not comply with the guidelines and was a barrier to guideline implementation.

> "Our diets were not consistent with our teaching . . . we did a study and found we need more fiber in our diets,. . . and put fish on the menu . . . and tried to take off all those eggs so that it would be consistent with what we're teaching." (3°)

Other dietitians mentioned lack of skills in counseling or leading focus groups.

> "I didn't take psychology [in University] and I wish I would have, because so many time I wish I could have more insight into that . . . advanced counseling education opportunities would be wonderful." (3°)

> "I'm with a mental health team and so often they encourage me to start a support group. . .and yeah I think it would be great to, but it's not something I'd feel 100% confident to do." (1)

As indicated in Table 4.8, the main barrier to guideline implementation was related to lack of time, resources and high workload. This was followed by dietitians indicating they lacked authority to make a change. There was also agreement that lack of patient compliance, and the guidelines being too general and not specific to nutrition were barriers to implementation. Factors relating to the environment dietitians worked in also impacted guideline implementation such as inadequate patient education materials, lack of supportive environments, lack of dietitians for patient referral, policies that prevent changes and other guidelines that take precedence.

4.3.5 Strategies to improve application of guidelines

One dietitian recommended including on the laboratory print outs of patients lipid results indications for diet therapy as well as medication to trigger physicians to interpret laboratory results for diet counseling referral not just medication prescription. This

suggestion is based on the fact that laboratory test results are usually interpreted based on their relation to a reference range.

> "Lab tests come back with just the primary prevention guidelines written on them and so when we use them in a secondary setting we have to develop our own information handouts for that, and I'm quite careful to explain to people that those are the guidelines for primary and once you have a heart problem they fall into these secondary guidelines." (2°)

> "There is no interpretation of lipid levels in terms of what a person . . . can provide for counseling. So if it were a doctor who was looking at those they'd say, 'Oh well, you need this type of medication' whereas when I look at it I think well maybe you need this dietary intervention." (2°)

Dietitians working at the management level suggested communication with other professions and professional groups to improve guideline implementation.

> "Coming up with consistent practice guidelines in the region and providing information packages to physician offices . . . train staff within those office maybe there are some counseling people who can determine whether they need more in-depth counseling." (M)

> "Advocacy is important, liaising with physicians, pharmacists, people who have influence in the community." (M)

> "Good to get dietitians message out from Dietitians of Canada, but also need linkages with other professional groups to make a difference." (M)

> "Need media to support what you do so general population agrees with what you're doing." (M)

Some dietitians indicated they would like guidelines to include not only what to counsel but also how to counsel and effect change, and what interventions are recommended once you decide what stage of change patients are at.

> "Even if there was good research and guidelines that you know like practice guidelines of how not only to counsel the specific things, but how to counsel. . . like how to effect change, what to do once you've decided what stage they're at." (3°)

Dietitians made suggestions regarding how the guidelines are developed, such as including a dietitian on the guideline committee and presenting an unbiased perspective.

> "Have more dietitians on these committees . . and make sure there is more nutrition representation." (2°,3°)

> "Like eggs pros and cons and unbiased viewpoint like not from the egg board . . milk fat is good for you and you're thinking well .. . I think we do get caught in the middle and lose credibility at times." (3°)

There were differences in the views dietitians had regarding the role of industry in research and guideline use, with one dietitian mentioning benefits of obtaining nutrition evidence from industry and another dietitian indicating concerns regarding influence of industry on guideline recommendations. Although benefits of dietitians working in industry on knowledge translation have been published (Green, 1996) no research has been done on assessing the information nutrition industry representatives provide to dietitians. Studies have been done on evaluating information pharmaceutical sales representatives provide to physicians and have found that often selected information is presented, claims may be misleading and information may be distorted, with the recommendation physicians need to critically compare the information they get from industry with scientific publications (Lexchin, 1997, Cooper, 2005). In regards to industry influence on guidelines, recent attention has been drawn to avoiding bias and conflict of interest in producing clinical practice guidelines (Canadian Medical Association Journal editorial, 2005). Some authors have indicated the food industry has influenced dietary guidelines (Nestle, 1993), and others suggest industry funding of scientific articles biases results (Lesser, 2007).

Open-ended comments on the survey indicated support for guidelines, such as "as clinicians we need to be consistent: and guidelines are essential." Strategies to overcome barriers to guideline use suggested an implementation tool box with policies and procedures, and ways to assist patients with compliance.

In the focus groups, dietitians overall indicated a positive attitude toward research.

> "I think research is really important because it's the driver behind your professional practice. It's the thing that changes the way you should be working" (1°)

"Research will have an ongoing importance for the application of our knowledge and the credibility of our profession and we will advance in the application." (M)

"More dietitians involved in research and more efforts that show how our intervention does make a difference so that we can increase the profile of our profession." (2°, 3°)

4.4 Discussion

Research utilization does not occur in isolation, and is not independent of the context in which it occurs. As Kitson (1999) indicates implementation of research findings is a function of the nature of the evidence, the appropriateness of the context, and characteristics of the intervention used to influence change. This appears to be the first study investigating contextual factors influencing dietitians use of nutrition evidence in practice, and the first study exploring how heart health research is used in dietetic practice.

Findings arising from the focus groups indicate how dietitians use research in practice depends on the context in which it is used. Dietitians used research to support the content of nutritional care as compared to the process of care such as the design and delivery of nutrition programs was seen in dietitians' use of research, guidelines and suggestions for improved guideline use. For example, clinical dietitians mentioned using research to update the content of patient education materials, but did not indicate using research to evaluate how patient education is delivered, which may be due in part to a lack of evidence about effective evidence-based education (Hale, 2000).

This difference in research use between the support of the content as compared with the process of nutritional care seemed related to the dietitians' role and is indicative of the difference in the amount of research evidence available. For example, in a review of 20 years of research regarding smoking cessation, efficacy of smoking cessation was well studied, whereas little research had been done on program design and delivery such as how much contact is required (Manske, 2004). In addition, as Hanney (Hanney, 2003) summarized, different types of research are relevant at different levels. Administrative

research relates to the allocation of resources that includes the amount of time dietitians have to provide nutritional care for patients, whereas clinical research relates to the content of what therapies are used. Thus clinical practice guidelines are necessary but not sufficient for evidence-based patient education and counseling since they lack information on implementation process (Toman, 2001). Toman and colleagues (Toman, 2001) reported on how they used an existing guideline to develop an evidence-based patient education program, where content was based on clinical evidence from the guideline and the implementation process was built on adult education evidence.

Dietitians also used research more in the context of providing usual care, as in the last client seen, and less when starting work in a new area or faced with a patient with an unusual condition or therapy. This finding is consistent with that of others (Pain, 2004). Dietitians use of research was influenced by their time constraints and availability of research to guide practice.

Findings from the survey of dietitians indicated colleagues are the top source of knowledge regarding research evidence or guidelines. Dietitians reported discussion with colleagues as their key information source and how they first learned about the dyslipidemia guideline. Discussion with colleagues was rated higher than more passive knowledge transfer strategies such as attending a lecture or reading a journal article. This is similar to Australian dietitians which indicated consultation with colleagues was one of the information sources most frequently used (Thomas, 2003), and primary care physicians which also rely on the opinion of peers or local opinion leaders over all other information sources (McColl, 1998). Research with physicians indicate a number of factors influence their information-seeking and discussion with colleagues is beneficial given pressures of time, convenience of access, and context or applicability to the clinical question (Perley, 2006). Colleagues "are familiar, reliable, immediately available, and inexpensive, they give concise, organized answers." (Dee, 1993). However as noted by others, colleagues may not necessarily provide current research knowledge (Pain, 2004).

The finding that dietitians working with a broader or more of a general mandate in primary care or management used the internet as an information source more than dietitians working in specialized areas such as rehabilitation or tertiary care areas, is similar to a survey of physicians which found family physicians were more like to use the internet to search for patient oriented material than specialists who searched for literature and journals (Bennett, 2005).

Results of the survey indicate dietitians are at the implementation stage in terms of use of the dyslipidemia guideline in their practice. Seventy percent of dietitians indicated they were aware of the Canadian Recommendations for Management of Dyslipidemia and Prevention of Cardiovascular Disease (CMAJ, 2003) and of these respondents, 84% reported changing their practice as a result of the guideline, and 72% of dietitians reported using the guideline on an often or always basis.

The length of time recommended for diet and lifestyle intervention before medication is begun requires more emphasis. Dietitians had difficulty in accurately indicating the length of time available for diet intervention in patients at moderate risk of cardiovascular disease. As Smith and colleagues (Smith, 2006, pg. 28A) indicates, therapeutic strategies ranging from individuals at high risk (aggressive risk factor management) to those at low risk (periodic monitoring) are relatively straightforward, however further risk stratification will carry its greatest benefit for patients who are at moderate risk and comprise the largest segment of the population. In the focus groups, one of the barriers to guideline implementation was that individuals were already on lipid-lowering medication before they were referred to the dietitian for diet therapy, thus preventing assessment of intervention. Others have reported similar barriers with suboptimal recommendations by physicians for lifestyle interventions even in low-risk patients (Mosca, 2005). Less than half of patients receive dietary counseling (McBride, 1998) patients are treated with medications even in those at low risk, and thus there is a need to reassert the importance of the effectiveness of diet intervention for the treatment of dyslipidemia and heart health (Whitham, 2006). Furthermore as indicated by a dietitian in a focus group, in individuals at high risk, maximal medication therapy will not reduce risk of developing

cardiovascular disease with poor diet/lifestyle compliance, which is consistent with findings from a clinical trial which showed marked reduction in coronary events with combined lifestyle and pharmacologic lipid treatment as compared with pharmacologic lipid treatment alone (Sdringola, 2003). In an era of statin therapy, some have indicated dietitians need to become 'political activists' in educating physicians about the importance of nutrition therapy (Palmer, 2007).

The amount of time dietitians spent counseling patients was similar to that reported elsewhere with 57 minutes for the initial assessment and 28 minutes for follow-up sessions (Hanning, 2002; Underbakke, 1993; Hyman, 1992). As reported previously (Hanning, 2002) less than half of dietitians offered follow-up sessions, which is inadequate since approximately three follow-up interventions are needed to sustain effects of dietary intervention (Hebert, 1999). However as indicated in the focus groups, time and resource constraints limit the number of follow-up sessions offered. Alternative methods for follow-up of patients such as telephone (Vanwormer, 2006), electronic-mail (Plotnikoff, 2005) and web-based (Plotnikoff, 2006) strategies need to be investigated in dietetic practice.

Although almost all dietitians reported conducting nutritional assessments, fewer completed anthropometric measurements. Only 62% of dietitians reported measuring body weight on an often or always basis, which is similar to Hanning and colleagues (Hanning, 2002) where only half of dietitians reported weighing clients. Given the well documented effects of body weight on dyslipidemia and blood pressure (Brown, 2000), and under-reporting that occurs with self-reported weight (Narwaz, 2001) measuring body weight is important. In addition, as the Canadian dyslipidemia guidelines indicate, waist circumference provides an estimate of abdominal obesity and indicator of cardiovascular risk (Genest, 2003), with more recent research indicating waist circumference itself is associated with cardiovascular disease independent of the effect of BMI (Haffner, 2006). However less than 20% of dietitians reported measuring waist circumference on a regular basis, which may as indicated in the focus groups be due to

dietitians being uncomfortable and/or lack training in doing waist circumference measurements.

There are a number of contextual factors dietitians perceive as facilitators or barriers to guideline implementation. The main barrier to guideline implementation dietitians mentioned was lack of time, lack of resources and high workload and is similar to findings from studies with other health professionals. For instance, studies in nursing have indicated lack of time, lack of knowledge of the research practice, lack of autonomy with senior colleagues, managers and medical staff are barriers to guidelines (Cavanagh, 1996). Dietitians did not indicate lack of knowledge as a barrier to guideline implementation, but rather saw guidelines as a priority area.

Dietitians responding to the survey rated lack of authority or autonomy to make a change, and policies prevent changes as barriers to guideline implementation. In contrast, as indicated in the focus groups, management dietitians expressed difficulty changing current practices and policy to implement the MNT protocol, but were ultimately successful. Involvement of dietitians working at the management level may be an important strategy in making change happen and is similar to the finding that involvement of nurse managers facilitated guideline implementation (Wallin, 2005), and the observation of Jain and colleagues (2006) who reported involvement of clinical dietitians as the opinion leader in changing critical care practice may have been less optimal than working with physician opinion leaders and administrators (Jain, 2006).

Amongst the top five barriers to guideline implementation that dietitians mentioned was lack of patient compliance. Compliance refers to how well a patient follows the management plan developed with her/his health care provider (Chockalingam, 1998). The patient perspective warrants further study. As Grol (Grol, 2006) suggests, guideline developers would do a far better job if they focused on the needs of the end user and provided clear statements, decision aids, patient education materials and practical tools to manage difficult problems in practice. Some researchers have investigated the impact of patient-centred care. Although a patient-centred care approach has been found to be

beneficial in improving metabolic outcomes of patients with diabetes, a survey of dietitians and patients after a nutrition counseling session indicated 44% of the time there was disagreement on goals set (Parkin, 2003). This misunderstanding of goals to be achieved could lead the patient to being labeled as non-compliant or difficult, when communication or failure to put the patient at the center of the care is more likely. However dietitians have expressed difficulty in recognizing client expertise and are uncomfortable in providing patients with autonomy to manage their disease (MacLellan, 2006; Parkin 2003).

Another top barrier to guideline implementation was that the Canadian Recommendations for Management of Dyslipidemia and Prevention of Cardiovascular Disease (CMAJ, 2003) were reported to be too general. Only one third of dietitians indicated they used practice guidelines such as US National Cholesterol Education Program - ATP III - Therapeutic Lifestyle Changes (2002), which contain more specific nutrition information, and as suggested by focus group participants, guidelines which include detailed nutrition content are needed for Canadian dietitians. In summary, the difficulty dietitians have with implementing guidelines due to lack of a supportive environment, requires more emphasis on the broader determinants of health and a population focus (Raine, 2005). The lack of dietitians in primary care was identified as a barrier to guideline use, was similar to a study of family physicians in Nova Scotia regarding evidence based cardiovascular care, which indicated an inadequate number of nutritionists/dietitians was a barrier to implementation (Putnam, 2004).

4.4.1 Limitations

Recall bias was an important limitation in this study. Like other diffusion investigations this study has been postdictive in investigating how the adoption occurred (Rogers, 1995). There was a time period of one year between the publication of the guideline and the data collection phase of this study, which might have resulted in some respondents being unable to reliably and accurately recall their actions during that time. In addition there might have been some social desirability bias. The respondents might have

responded in ways they thought the interviewer wanted them to. The researcher attempted to overcome this issue by stressing the results of the study would be kept confidential and only group data would be reported.

The other potential limitation is a low response rate with the survey, however 34% does compare favourably with other recent surveys conducted with dietitians in Canada, which range from 20% (MacLellan, 2006), 21% (Hanning, 2002) to 47% (Kalergis, 2006).

4.4.2 Implications for Practice

Whether and how health professionals implement research results will also potentially impact health outcomes of patients. In order to ensure that information dissemination programs make a difference in practice, we must learn more about the conditions under which practitioners change their behavior in response to new information and apply this to the design and delivery of research and practice information.

The methods by which guidelines and recommendations are disseminated in the future should consider how dietitians use research in their practice. For instance, building on dietitians primary source of information as colleagues, it would be beneficial to explore the effects of using 'academic detailing' and opinion leaders to change the practice of dietitians. It also identifies the need to develop opportunities for discussion with colleagues such as communities of practice (Sandars, 2006), and including unstructured time during continuing education events (Tipping, 2001). As well, because dietitians often consult colleagues, the formalization of expert peers who keep current with the literature and act as content consultants may enhance research use (Pain, 2004). Others have suggested use of list-serves and 'stories' regarding implementation of evidence in practice (Angus, 2003; Lewis, 2004) is beneficial to knowledge utilisation.

In addition to the existing clinical content of guidelines, more information needs to be included on the process of providing care, and include evidence regarding effective implementation such as effective educational practice, numbers of follow-up visits

required, counseling strategies and policies needed for changing practice. Further research needs to be done regarding the process of care, and impact different types of nutrition intervention can have on patient outcomes. In addition to having an understanding regarding transformation of data to information (also called "know-what") further clarification on the transformation of information to knowledge (also called "know-how") is needed so evidence can be implemented in practice (Landry, 2006).

The involvement of dietitians working at the management level in research use, warrants further study, since evidence in nursing (Wallin, 2005) and organizational (Browman, 2003) research suggest leadership has a pivotal role in the implementation of new knowledge. Since the main infracstructural barriers (such as lack of time, resources and high workload) to guideline implementation, requires management involvement to be addressed.

4.4.3 Conclusion

This study provides an overview of research use within dietetic practice including dietitians access to information and their perceptions of facilitators and barriers to guideline use. The results indicate contextual influences such as dietitians patient factors and type of practice in their use of evidence in practice. Dietitians used research more to support the content of nutritional care for typical patients and less for support of the process of care. Despite widespread support for the importance of research use, dietitians for the most part, did not refer to original research, but instead relied on the conclusions of others (e.g. discussion with colleagues, journal reviewers, textbook authors). The majority of dietitians are at the implementation stage in their use of the dyslipidemia guideline in practice, however indicated a number of facilitators and barriers to complete guideline implementation. If research use and evidence-based practice are to become a reality, barriers must be removed and systems to assist dietitians must be developed. Dietitians made a number of recommendations regarding implementation of research in practice which included not only characteristics of the guideline (more specific nutrition

information, unbiased perspective), but also the how the guideline is used (tools such as patient education materials, sample policies and procedures and how to effect change).

Table 4.1. Focus group interview guide of heart health dietitians

Questions regarding nutrition research utilization in practice
1. Think about the last patient with cardiovascular disease and/or risk factors that you had. How did you decide which intervention to use? Is there research to support that type of intervention?
2. Now think about the last time you changed/started work. What did you do to prepare for the change? Did you use any reference materials to prepare for the change? To what extent did you use research literature to prepare for the change in work?
3. Think about the last time you had a patient who presented with an unusual condition or unusual challenges. What did you do to plan your intervention program for this patient?
4. In regards to the Recommendations for the Management and Treatment of Dyslipidemia in Canada, what helps you apply these recommendations in your practice? What prevents you from applying these recommendations in your practice? What suggestions do you have for how these barriers could be overcome?
5. Anything else about using research in your practice?

Table 4.2. Demographics of dietitians participating in focus groups, n= 20

Item	Count (%)
No. of years in practice	
< 5 years	4 (20 %)
5 – 10 years	5 (25 %)
10 – 20 years	4 (20 %)
> 20 years	7 (35 %)
Education	
Bachelors	18 (90 %)
Masters	2 (10 %)
Type of practice	
Primary Care (community and out-patients)	3 (15 %)
Secondary (rehabilitation)	5 (25 %
Tertiary (acute care, in-patients)	4 (20 %)
Regional Mandate	8 (40 %)

Table 4.3 Themes that emerged from focus groups regarding dietitians' perceptions of research use, n=20

Areas where nutrition research is used
- To support content (e.g.omega-3 fats, fibre, DASH diet) of intervention
- In context of patient factors (co-morbidities, medical progress)
- In combination with values to make decisions
- To develop patient education materials
- There can be disagreement on interpretation of research/ evidence among dietitians
- To conduct research
Areas where nutrition research is less used
- When preparing for a new job research is used less than other information sources (textbooks, diet manuals, talking with colleagues)
- For unusual patients/ novel therapies than other information sources (internet, talking with colleagues or patients themselves)
- To support process of care (e.g. number of visits, length of visit) or intervention
- Research is less used to support process of intervention due to . . .
- Lack of time
- Lack of autonomy (e.g. patients follow-up visits determined by clinic protocol)
- Lack of research (e.g. little research on actual impact a dietitian teaching about nutrition has on that person's risk for heart disease)
In absence of research,
- Benchmarking (comparison with other programs/services) is used
- Extrapolation (from specific populations/ages) is used

Table 4.4 Themes that emerged from focus groups regarding dietitians' perceptions of facilitators and barriers to guideline use, n=20

Factors that facilitate use of guidelines in dietetic practice
- Education sessions (rounds, seminars)
- Awareness of importance
- Clinical leader (e.g., Cardiologist) support
- Clinical team support (e.g., referrals from other team members)
- Patient education materials
- Program structure (setting, frequency of visits etc)
- Audit and feedback (e.g., progress reports)
- Community resources (e.g., grocery store tours, collective kitchens)
- Inpatient menu consistent with guidelines
Factors that can be barriers to use of guidelines in dietetic practice
- Limited follow-up with clients (due to short length of stay, and clients from outside of region)
- Lack time
- Difficult to change current practice
- Guideline is too general, not specific enough for nutrition
- Lack of supportive environments (e.g. healthy choices in workplaces and community)
- Medications used as primary treatment more than diet
- Colleagues disagree with recommendations
- Lack training in counseling skills
- Lack of dietitians in primary care
- Lack of patient compliance
- Lab tests only have primary prevention guidelines for normal reference values

Table 4.5 Demographic characteristics of heart health dietitians surveyed (n = 51)

Item	Value (range)
No. of patients for cardiovascular disease risk modification seen per week	9 ± 10.7patients/ week
No. of years in practice	10 ± 7.5 years (0.5 – 27 years)
Education	
Bachelors	94 %
Masters	6 %
Type of practice	
Primary Care (community and out-patients)	42 %
Secondary (rehabilitation)	7 %
Tertiary (acute care, in-patients)	28 %
Regional Mandate	23 %
Location of practice	
Chinook Regional Health Authority	10 %
Palliser Health region	6%
Calgary Health region	8 %
David Thompson Regional Health Authority	21%
East Central Health region	6%
Capital Health	14 %
Aspen Regional Health Authority	10 %
Peace Country Health	14 %
Northern Lights Health region	6%
Lifestyle	
BMI (average)	22.8 ± 2.4 kg/m^2 (18 – 27 kg/m2)
Non – smoker	100%
No. days per week physically active	4 ± 1.8 days /week (1 – 7 days/week)
Amount of time physically active	45 ±20 minutes/day (15 – 120 mins/d)
Average number of servings of vegetables and fruit per day	5.8 ± 1.4 srvgs /day (4 – 8 servings/d)
Frequency of use of information	
American Heart Association Population based guidelines at the Community level, 2003	20 % *

Data are presented as mean ± SD for continuous variables and frequency (%) for categorical variables.

* Percent reporting using the guideline 'often' or 'regularly'

Table 4.6. Dietitians use of information sources (n = 51)

Information Source	Mean[a] ± SD	Frequency[b] %	Differences across groups[c]	Significance χ^2 p value Cramer's V
Discussion with dietitian colleagues	3.96 ± 0.751	74 %	Primary (78%) Tertiary (69%) Regional (46%)	10.67 0.030* 0.462
Review articles	3.83 ± 0.87	70 %		NS
Canadian Recommendations for Management of Dyslipidemia (CMAJ, 2003)	3.88 ± 1.48	74 %		NS
Textbooks and manuals	3.54 ± 0.93	68%		NS
Manual of Clinical Dietetics (ADA/DC, 2000)	3.42 ± 1.10	56 %		NS
Original research articles (clinical trials)	3.67 ± 1.01	58%	Primary (58%) Tertiary (56%) Regional (46%)	9.73 0.045 * 0.441
General internet and web-based information (e.g. Google)	3.13 ± 0.92	42%	Primary (44%) Tertiary (19%) Regional (39%)	15.71 0.003 * 0.566
US - ATP III Therapeutic Lifestyle Changes (NCEP, 2002)	2.79 ± 1.50	32 %		NS
Benchmarking with other programs	2.83 ± 1.09	22%		NS
Communication with specialists (eg Cardiologists)	2.58 ± 1.02	18%		NS
Population based Guidelines at the Community Level (AHA, 2003)	2.18 ± 1.22	18 %		NS

[a] mean scores are on a 5-point scale, where dietitians rated their frequency in use of the various sources of information from 1- never, 2- seldom, 3-occasionally, 4-often, to 5 –regularly.
[b] Percent (%) using information source often and regularly
[c] Excludes dietitians working in secondary care due to small sample size (n=6)
* statistically significant, $p<0.05$

Table 4.7. Dietitians use of the guideline in practice (n=51)

Guideline use	Agree %*	Mean ± SD
Guideline used to acquire additional information	100 %	4.1 ± 0.61
Guideline is used on a regular basis	78 %	4.0 ± 0.75
Guideline is used to revise education resource materials	69 %	3.9 ± 0.91
Guideline is used to change counseling practice	82 %	3.9 ± 0.74
Guideline is used to change work practice	69%	3.8 ± 0.84
Guideline is used to promote the guideline to others	66 %	3.8 ± 0.86
Guideline is used to change policies and procedures	36 %	3.2 ± 1.0

* Percent 'Agree' or 'Strongly Agree'

Table 4.8. Contextual factors that influence use of guideline in practice (n=51)

Facilitating Factors	Agree %*	Mean ± SD
Awareness of importance	100 %	4.06 ± 0.61
High priority	70 %	3.81 ± 0.9
High level of evidence	67 %	3.81 ± 0.82
Low cost to implement guideline	63 %	3.65 ± 0.93
Patient education materials	60 %	3.48 ± 0.95
Education sessions (rounds, conferences)	46 %	3.33 ± 1.09
Clinical lead or local champion	33 %	3.06 ± 1.08
Consulting with specialists	26 %	2.81 ± 1.06
Policies and procedures	22 %	2.75 ± 1.12
Community resources	17 %	2.52 ± 1.01
Office reminder system	14 %	2.37 ± 1.05
Being involved in research	3 %	2.42 ± 0.94
Barriers to guidelines use in practice		
Lack time to implement	64 %	3.19 ± 1.18
Require more resources for implementation	62 %	3.10 ± 0.99
Forget due to high workload	60 %	2.95 ± 1.05
Lack authority or autonomy to make a change	58 %	2.89 ± 1.10
Lack of patient compliance	54 %	2.72 ± 1.10
Guidelines are too general, not specific enough	54 %	2.74 ± 1.12
Inadequate patient education materials	52 %	2.61 ± 0.83
Lack dietitians for patient referral	52 %	2.55 ± 0.92
Lack of supportive environments	52 %	2.64 ± 1.13
Policies prevent changes	52 %	2.61 ± 0.89
Other guidelines take precedence	52 %	2.59 ± 0.97
No advantage to change current practice	50 %	2.53 ± 0.94
Clinical judgment is superior to guideline use	50 %	2.50 ± 0.90
Colleagues disagree with recommendations	48 %	2.39 ± 0.68
Guidelines are outdated	48 %	2.39 ± 0.68
Guidelines do not include rating of evidence	48 %	2.44 ± 0.96
Not a priority area	48 %	2.44 ± 1.12
Not relevant to my patients/ program	46 %	2.27 ± 0.87
Lack knowledge	46 %	2.30 ± 0.95
Lack training in counseling skills	46 %	2.32 ± 0.92
Lack confidence in ability to counsel about lifestyle	42 %	2.06 ± 0.70
Information is too complex	44 %	2.24 ± 0.64

*Percent indicating 'Agree' or 'Strongly Agree'

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CHAPTER 5. NUTRITION IN HEART HEALTH PROMOTION IN REGIONAL HEALTH AUTHORITIES

5.1 Introduction

Cardiovascular disease remains the leading cause of death and disability, accounting for 36% of deaths in Canada (Heart and Stroke Foundation, 2003). It is well established that individuals with healthier lifestyles including healthy eating practices have a lower incidence of cardiovascular disease (Stampfer, 2000). In the 1980s cardiovascular risk reduction focused on public health education. However community based projects focused on community-wide health education and social marketing of nutrition and health messages had only a small impact on diet and other health behaviors (Winkleby, 1997). Population based strategies that include modifying environments and policies that influence health and nutrition have had a greater impact (Puska, 2002). This latter approach is consistent with the Ottawa Charter for health promotion that indicates that in addition to development of personal skills, reorienting health services, strengthening community action, create supportive environments and building healthy public policy is necessary. Health promotion is the process of enabling people to increase control over circumstances that affect their health and to improve their health (WHO, 1986).

The benefit of any health intervention is determined by the extent to which it is adopted and implemented. This study investigates the dissemination of nutrition in heart health promotion in regional health authorities using quantitative and qualitative approaches, according to health promotion concepts and diffusion of innovations theory (Rogers, 1995). Health promotion dissemination research is the study of the processes and variables which influence the adoption of health promotion and disease prevention knowledge, interventions and practices (Johnson, 1996).

The purpose of this research was to investigate, using qualitative and quantitative approaches, dissemination of nutrition in heart health promotion in a regionalized health

system. In particular, the goal was to explore contextual influences on the successful implementation of nutrition evidence within health regions, and to estimate the level of nutrition in heart health promotion in health regions.

5.2 Methods

The Alberta Heart Health Project (AHHP) involved a time-series cross-sectional research design (see Table 5.1), incorporating both quantitative and qualitative methods to assess heart health promotion. A qualitative approach allows for in-depth exploration on factors influencing adoption and implementation of nutrition in heart health promotion in regional health authorities. Given the complex and intricate environment of health care settings, a combination of quantitative and qualitative research approaches were appropriate to examine nutrition in health promotion in RHAs. In 1999, all 17 of Alberta's RHAs were invited to participate in the project and, by 2000, the Chief Executive Officers (CEO) from each region consented. Each RHA then appointed a site coordinator from within the organization to act as the liaison between the RHA and the project. For the quantitative survey, a purposive sample representing frontline service providers, board members and senior/middle management was administered to all the regions. The intensive qualitative assessments were limited to three regions representing high, medium and low capacity levels and further explored organizational contexts associated with RHA capacity to address nutrition in heart health.

A valid and reliable survey instrument to assess organizational capacity for heart health promotion was developed and tested as previously described (Anderson, 2004; Anderson, 2005; Barrett, 2005; Plotnikoff, 2005). Factor analytical techniques were done to confirm unidimensionality of the scales and in order to verify the reliability of the scales, Cronbach alphas were calculated which ranged from 0.75 to 0.95 (Anderson, 2004; Anderson, 2005; Barrett, 2005; Plotnikoff, 2005). As part of the annual assessment of capacity for each RHA regarding health promotion, quantitative data were collected over time from baseline, year one, year two and year four. No surveys were done in 2003 due to restructuring of the regions. One-third of the respondents were repeated respondents

and responses were received from all levels of the organization (board, senior management and service provider) thus providing a consistent representative sample to assess organizational capacity. The first survey was considered a baseline of health promotion capacity and assessment of overall organization capacity was used to categorize regions into high, moderate or low capacity regions based on frequency distribution of scores (see Appendix 5). Following each self-assessment by the RHAs, feedback regarding their categorization of capacity as well as their mean responses in comparison with the mean responses from all RHAs was provided by the AHHP project team in the form of reports, single page report cards and presentations. Education interventions were done during the study to increase the organizations' knowledge, skills and leadership for addressing socio-economic determinants of health and included a health promotion summer school, forums and workshops that were targeted towards service providers, Medical Officers of Health, and RHA senior management including RHA Council of Chairs and CEOs.

The survey included four separate questions related to physiological, behavioral, psychosocial risk factors and environmental risk conditions: knowledge, belief the organization should address, ability to address, and level of involvement during the past 12 months. Five-point Likert-type scale categories were provided for each item, resulting in a lowest possible score of "1"(e.g. Strongly Disagree/None) and highest possible score of "5" (e.g. Strongly Agree, Regularly). The risk factor of poor diet was grouped with smoking and physical inactivity as a behavioral factor. The survey also included assessment of participation in addressing behavioral risk factors in various settings including their ability to conduct these activities, current level of involvement, and desired level of involvement. For all three behavioral risk factors of smoking reduction, nutrition, and physical activity, the setting included schools, workplaces, health care settings and the community at large. For nutrition related activities restaurant and grocery store settings were also assessed.

5.2.1 Focus groups and semi-structured interviews

RHAs were selected by the AHHP research team from each capacity category, for intensive assessment. The basis for RHA selection was not participating in the demonstration phase of the AHHP, and geographical variability, representing north, central and southern Alberta. Semi-structured individual interviews and focus groups in three RHAs representing high, medium, and low capacity were conducted with 24 key informants from three organizational levels including board members, senior/middle management and service providers. An interview guide was used to focus on predetermined concepts but allowed for flexibility to probe into other emergent themes. Questions prompted participants to reflect on what facilitated organizational health promotion capacity in their RHA, what was needed for capacity building and indicators of health promotion capacity. Sessions were tape-recorded and transcribed verbatim. Field notes were recorded directly after each interview to gain further insight into the discussed topics. Procedures for informed consent and confidentiality were applied throughout the duration of the study.

5.2.2 Document Review

RHAs Business Plans and Annual Reports from 2002 were located through the government and regional health authorities websites and directly from RHAs. Documents were read to identify key themes, to explore areas of commonality, provide contextual data regarding nutrition in heart health promotion. Document review is considered useful in portraying the values, beliefs, and viewpoints expressed by participants in a particular setting and can provide valuable insights when used in combination with other methods (Giacomini, 2000, Farmer, 2006). RHA business plans outline the health authority's responsibilities and results to be achieved, and are an accountability document to the provincial government on what is to be achieved. According to the requirements from Alberta Health and Wellness, RHA "business plans should be based on a broad definition of health, reflecting a determinants of health approach, which considers the influence of a range of factors on health status." (Alberta Health & Wellness, 2000, pg 7). Business plans and annual reports were reviewed for

frequency and prominence of themes relating to heart health promotion, food and nutrition activities, and for the sake of comparison, reviewed for activities and programs relating to smoking and physical activity.

5.2.3 Data Analysis

5.2.3.1 Quantitative Data Analysis

Survey data regarding assessment of organizational capacity for health promotion were analyzed. This assessment is based on individuals reflecting on the organization as a whole regarding heart health promotion. Principal components analysis (PCA) was done to reduce data on related attributes in the multidimensional dataset to lower dimensions for analysis. All the scales were proven to have high internal reliability with Chronbach's alphas ≥ 0.66 (Anderson et al., 2004). PCA facilitated comparison of RHA capacity to address physiological, behavioral, psychosocial and environmental risk conditions.

Statistical analyses were performed using the Statistical Program for the Social Sciences (Windows version 12, 2005, SPSS, Inc, Chicago, IL). To investigate differences in knowledge, belief, confidence and involvement and frequency in addressing risk factors by regional health authorities over time, multivariate analysis of variance was done to test groupings of variables. Equality of variances was tested by using Levene's test. Comparison of group mean differences were conducted using the F Test. This was followed (when significant) by post hoc analyses using Bonferroni test to specify the nature of the differences.

It should be noted that parametric statistics have been used on ordinal categorical data. Since the rating levels with integer anchors on the Likert-type scales implies rating levels are evenly spaced, and thus meet the assumptions of interval-level data (Kim, 1975).

5.2.3.2 Qualitative Data Analysis

Qualitative data analysis involved synthesizing large quantities of text. Thematic analysis is a strategy to synthesize data by applying codes or themes to the raw data (Rothe, 2000). Themes were analyzed according to the components of the Ottawa Charter for health promotion and Roger's Diffusion of Innovations theory (Rogers, 1995). The Ottawa Charter for Health Promotion (WHO, 1986) includes strategies for supporting developing *personal skills* through providing information, education for health and enhancing life skills as strategies for health promoters to use; *reorienting health services* by healthcare moving increasingly in a health promotion direction, beyond its responsibility for clinical and curative services; and in *building healthy public policy, creating supportive environments, and strengthening community action.*

Emerging themes were analyzed using the Diffusion of Innovations theory (Rogers, 1995). The diffusion of innovations is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). The innovation process in an organization consists of three broad activities: 1) initiation which includes information gathering, conceptualizing and planning for the adoption of an innovation; 2) decision making, and 3) implementation which includes all of the actions involved in putting an innovation into use. In the first stage of initiation, agenda-setting occurs when an organizational problem that may create a perceived need for an innovation is defined. This is followed by matching the problem from the organization with the innovation. After the decision to adopt has been made, during the implementation stage, the innovation is modified and redefined to fit the organization, the innovation is more clarified and then it becomes routinized or institutionalized where the innovation is part of the organization's ongoing activities. Implementation refers to performance of heart health promotion by RHAs. The stages in the innovation process in an organization have been incorporated into a conceptual model (see Figure 5.1) of organizational capacity building (Smith, 2001).

5.3 Results

5.3.1 Survey results

Table 5.2 indicates the knowledge, belief, ability to address and level of involvement in risk factors and conditions from RHAs over four years. Organizational involvement in addressing behavioral risk factors such as poor diet, smoking and physical inactivity was consistently assessed at a high level, demonstrating a ceiling effect where the majority of the scores are at or near the maximum. In contrast, RHA's knowledge and level of involvement in addressing environmental/psychosocial risk factors increased over the years from baseline. The mean knowledge score of psychosocial increased statistically significant from 3.09 ± 0.86 at year 2 to 3.48 ± 0.87 at year 4 ($p<0.05$), with a change from "seldom" involvement, mean score of 2.67 ± 0.84 at year 2 to "occasional" involvement, mean score of 3.11 ± 0.88 at year 4. Likewise, the mean knowledge score of environmental risk conditions was 2.71 ± 0.95 at year 2 and 3.1 ± 1.01 at year 4 ($p<0.05$) with an increase in involvement from a mean score of 2.26 ± 0.84 to 2.64 ± 0.96.

As indicated in Table 5.2, involvement in smoking cessation activities overall was higher (3.9 ± 1.0) than compared to nutrition (3.7 ± 1.0) and physical activity (3.2 ± 1.0) in various settings. This trend was also reflected in RHA's reported level of ability to address diet (3.2 ± 1.1) and physical activity (2.7 ± 1.1) as compared with smoking (3.6 ± 1.1). The highest levels of reported involvement for all behavioral risk factors was found in health care and schools as compared with community-based settings such as restaurants, grocery stores, and workplaces (Figure 5.2b).

RHA involvement in nutrition-related activities was similar over time in restaurants, improved slightly in healthcare settings and increased significantly in schools, grocery stores, workplaces and community settings (Figure 5.3). However RHA involvement in nutrition related activities was assessed as "seldom' to 'occasional' in most settings.

In addition to mean scores for all respondents, it is interesting to look at differences between respondents. Table 5.3 shows that overall, board members rated their organizational knowledge, belief, confidence and frequency in addressing behavioral risk factors higher than management respondents who in turn reported higher scores than respondents working at a service provider level. In particular, management and board members reported a statistically significant greater level of organizational knowledge and confidence in addressing smoking as a risk factor than service providers ($p < 0.05$). Management respondents also reported a greater level of organizational knowledge of poor diet and physical inactivity as a risk factor than service providers ($p < 0.05$).

5.3.2 Qualitative – interviews and focus groups

Semi-structured individual interviews and focus groups consisting of participants from various levels within each of three RHAs including board members, senior management CEOs and vice-presidents, middle management and front-line staff were held. The over-arching themes that emerged from the interviews and focus groups regarding nutrition in heart health promotion are summarized in Table 5.4 (more detailed descriptions are contained in Appendix 6). In order to portray participants' experiences, their own words are used as the best description of the particular theme. Identifiable names have been removed to preserve confidentiality of respondents and regions.

5.3.2.1 Develop Personal Skills

Throughout the regions, developing personal skills was emphasized. The high capacity region used mass media to provide healthy eating messages and healthy food preparation demonstrations, the medium capacity region indicated they had developed nutrition education resources, and the low capacity region expressed a desire to do nutrition education in schools and amongst families.

> "We use the radio to do, as well as the newspaper…every week we have an article on health promotion or something that's usually relevant to, you know, the month or the season or something. We …collaborate with other agencies on some of their promotion issues. …the next thing will be healthy recipes …there's going to be a cook-off." (high capacity region, implementation stage)

> "We have some beautiful aboriginal healthy eating and resources... they're going to be disseminated to the aboriginal coordinator position through Health Canada. I think the harder part was taking that message back to our regional health authority and convincing them that these were good things and they should regularize these funds. it was provincial proposal dollars and national proposal dollars directed toward aboriginal programs that kept us coming back until...it's been now regularized into the Health Region budget." (medium capacity region, implementation stage).

> "Say public health needs to have the manpower and the time to do teaching. Like in the schools, the children are in desperate need to learn about nutrition because they're losing a battle, they're all becoming "type two diabetics, which means again they're not eating right, they're not exercising right. There's a knowledge gap there, there's a real problem." (low capacity region, initiation stage).

> "A highly immune[ized] population doesn't do you any good if they're all falling apart at the seams ... they're feeding their kids all the wrong things." (low capacity region, initiation stage)

The low capacity region was at the initiation phase regarding developing personal skills since they had indicated there was a need to do education regarding increased rates of obesity in children, whereas the medium and high capacity region where at the implementation stage with the high capacity region implementing mass media nutrition education, and the medium capacity region had indicated funding for nutrition education resources had been regularized as part of the region's budget.

There was also mention of the need to develop personal skills of health care providers. The high capacity region recognized the need to improve nutrition health promotion skills of physicians and dietitians, and the medium capacity region indicated they have been providing some education and training for healthcare providers regarding nutrition and determinants of health, and for the board regarding health promotion.

> "We have always said, 'You facilitate population health throughout the organization.' So, it's everyone's responsibility. ...what I would hope in the future would be to see, ' physicians, saying to their patients who come in for a common cold, how is your nutritional intake?" (high capacity region, initiation stage)

"They've got a website that's got wonderful research-based efficacy in so far as treatment regimes and I know that I could walk upstairs right now and still see people practicing in old ways in that field and probably every other field. I know in nutrition that there's lots of room for improvement, in our nutrition counseling." (high capacity region, initiation stage)

"Our dietitians, they get nutrition news. . and if its something that interests us, then they forward that ...and then we post it on our bulletin boards. And we've got a heart health resource center so we'll put things up in there, you know, for the general public to read." (medium capacity region, implementation stage)

"We did a workshop, we've done several in the last year. Part of this was related to our poverty initiative, but it has a broad application. We did a community development workshop where we invited staff from other departments, and quite a few did participate. We did a social marketing workshop where again, several of the departments participated." (medium capacity region, implementation stage)

"No one put in my job description that I've got to train a new board every three years [about health promotion concepts]." (medium capacity region, implementation stage).

5.3.2.2 Reorient Health Services

The high capacity health region indicated they had made the decision that their entire organization would be health-promotion driven, whereas the medium capacity region indicated some dietitian positions had been changed to be half clinical and half health promotion. In contrast, the low capacity region was at the initiation stage where they saw the need to reorient health services from acute to community services.

"I think the philosophy of management has been from that time, . . . to weave health promotion through all aspects of our service delivery. And I think that was good because it brings the awareness to everyone. Like instead of like the 25 or 30 people we had working community before being a voice for health promotion, now we have 700 people." (high capacity, implementation stage)

"clinical dietitians ... that also serve a health promotion role." "instead of more traditionally we would have those positions go out as full clinical positions we've split those positions so that they're half health promotion specialists and half clinicians." (medium capacity, implementation stage)

The medium capacity health region expressed frustration with fully implementing health promotion due to lack of understanding and support amongst management and across the organization.

> "When I say the organization, the board has adopted the determinants of health framework as they endorse that concept. But at the next level, the senior management are struggling with that concept because most of them come out of an acute care and they keep saying there's no evidence." (medium capacity, decision stage)

> "If you're one out of twenty people in the room, and the only one arguing for health promotion, you don't carry an organization." (medium capacity, decision stage)

However the low capacity region although recognizing the benefits of health promotion and desire to shift more resources from acute to community services, lacked the political will to reorient health services and indicated taking action on environmental risk factors is politically risky.

> "We're being funded on a per capita basis, the healthier your population is, the more money you have available." (low capacity region, initiation stage)

> "Need to downsize our acute, and long-term care, we're heavily over-bedded . . . ineffective acute care beds in small towns rather than primary health settings, as multi-disciplinary teams." (low capacity region, initiation stage)

> "Politics of health, health is seen as in hospitals, and hospitals are seen as economic development for small towns." (low capacity region initiation stage)

> "It is comfortable to focus on the so-called lifestyle factors because they're politically safe. It is not comfortable to focus on environmental factors, .. because they are politically risky, okay. And you are dealing with one of the most conservative areas in Alberta."(low capacity region initiation stage)

The low capacity region had indicated some progress regarding reorienting health services and had indicated they had recently funded a health promotion position.

> "a position for health promotion. And then also put cardiac rehab, diabetes and nutrition, under that because we basically, we wanted to move those

into more wellness focused versus, you know, an illness model, rehab model." (low capacity region, implementation stage)

5.3.2.3 Strengthen Community Action

Participants of the high capacity region had many examples of ways their region strengthens community action through partnerships with the implication that working with community partners was the way of doing business in their region. The high capacity region partnered with industry, community groups and education institutions. The medium capacity region saw community partnerships as a ways of expanding limited resources and partnered with community and education institutions. The medium capacity region was working in collaboration with the food bank to develop a community kitchen, and recognized more could be done about physical activity and nutrition. This region had also experienced lack of community support in one community to address poverty. The low capacity region recognized more could be done with community partners but lacked resources. Previous decisions in the low capacity region regarding program participation in community kitchens and promoting healthy eating and heart health amongst a high risk population had been discontinued.

"1995 when we received the designation of World Health Organization Safe and Healthy Community. We were the first community in North America and we were very proud of that and what has spun out of that is a meeting of the minds of industry and school and small business and health. The [X] college here, and many of the NGOs meet on a monthly basis with what they call the [X] Safe Healthy Community Network and so that's a time where, monthly, they talk about injury prevention, health promotion, education and community initiatives, networking to meet the same goal – to meet the goal of improving the wellness of the people of our region." (high capacity region, implementation stage).

"Overall, as an organization, we partner a lot. I would say it's pretty key in all of the processes that we do to work within the community and the education institutions." (medium capacity region, implementation stage).

"We had good statistics on poverty rates throughout the region. We decided to do a pilot project in two communities. We approached one community and they were certainly in denial that no, we don't have a poverty problem, where are these people? We decided not to proceed with that community because we just didn't feel they were ready to address the issue." (medium capacity region, initiation stage).

"We're working on a project with the food bank. An inter-faith food bank and we've been meeting with their board members and people from here have been meeting with them to do a community-kitchen for people living in poverty, I have a meeting . ..with their fundraiser guy. We'll talk about different ways to get money and then we'll talk about the grant writing." (medium capacity region, decision stage)

"In terms of physical activity and nutrition I think we're still...people are becoming more interested and becoming more keen but I think we're just kind of at that tip of the iceberg. We're just starting to get the awareness out there and people are realizing...So, I think we still have a long way to go." (medium capacity region, initiation stage)

"We don't have those designated people that can get out and do the work, you know, even if you start with your organized groups, like your Kiwanis, like your Chamber of Commerce people, your business people.... It takes manpower to get out and be with the public and start working towards building that capacity." (low capacity region, initiation stage)

"[We] had a Hutterite Heart Health project and this was huge, and the whole gist of that was to reduce obviously, heart disease amongst the Hutterite population. And this was quite big and it involved a nutritionist and, um, you know, learning how they did things. Not to change the foods they eat, because you're not going to change the foods they eat, but maybe cut down on a little bit of fat, and instead of frying this, maybe bake it, things like that.. . . And it wasn't funded after two years, which was a huge disappointment. . . bigger organizations have people whose sole job it is to write funding proposals." (low capacity region, decision stage)

5.3.2.4 Create Supportive Environments

The high capacity region recognized work needed to be done regarding creating supportive environments for healthy eating and that nutrition education alone will not change behavior. The medium capacity region had used the Alberta Cancer Board's 5-a day program to promote vegetable and fruit consumption in various community settings, and was involved in developing a school food program. Participants in the medium capacity region indicated previous heart health promotion programs in community, recognized the need to have restaurants that serve healthy food, however questioned whether RHAs should be involved in promoting physical activity in the community and workplace wellness. Participants in the low capacity region also identified a number of

problems such as unhealthy foods in schools that are needed for funding raising, and need for healthier catering.

> "You're up against McDonald's and Burger King, and whoever else, and you're not going to get anywhere handing out Canada's Food Guide." (high capacity region, initiation phase)

> "So they've gone into schools and looked at . . . some of the feeding issues and some of the poverty and the food security type things." (medium capacity region, implementation stage)

> "The 5-10 a day…to have the logo there and being able to use that. We did use that for some grocery store displays and mall displays, restaurant displays. It was already in place. We didn't have to design it, which was nice." (medium capacity region, implementation stage)

> "Like they used to have heart health fairs, I remember, and you just don't see that as much. I know they did the restaurant Heart Smart." (medium capacity region, initiation stage)

> "We need to take some responsibility .. . a café that serves healthy snacks, meals." (medium capacity region, initiation stage)

> "Physical activity is one that we haven't done extremely well. In part because its not clear who is in charge, there are other players here. Recreation is seen as one of those nice to have, but not necessary to have. And municipal levels, other structures have sort of sunk. We've got to start asking ourselves what is our role there. I also don't think its appropriate for the health sector to be the leader in every one of these areas." (medium capacity region, initiation stage)

> "Its doing some things like getting the candy and pop machines out of our schools because they see that as a way to raise money to pay for basic, basic things, . . . [But as one board member said well] we can't go over and tell them what not to do, you know, like vending machines in schools and things like that." (low capacity region, initiation stage)

> "Maybe it's going to talk to the people who are in the grocery stores and saying you know I know you're wonderful community people and you donate a lot. Can we talk about how maybe instead of the sugar donuts you could give them a break on a fruit tray. You know it's changing their thinking about it." (low capacity region, initiation stage)

5.3.2.5 Build healthy public policy

Most of the discussion and examples regarding building healthy public policy related to smoking. The high capacity region indicated a member of the RHA executive took a leading role in changing the smoking bylaw, whereas the medium capacity region executive had reservations about leading change on smoking, and the low capacity region indicated a community member took lead on the local smoking bylaw. The low capacity region also indicated their reluctance to influence school food policy. The high capacity region suggested RHA executives could be more influential in building healthy public policy, and the medium capacity region suggest more direction from the province for building healthy public policy and for boards would be helpful.

> "Our vice-chair, actually took on a leading role in this community to affect the smoking bylaw here and we did see effective change." (high capacity region, implementation stage)
>
> "I think that the Council of Chairs and the Council of CEOs, as the leaders of the regional health authorities, could be more influential in the swaying or actually changing public policy." (high capacity region, initiation)
>
> 'Found you can take health promoting activities to a certain extent, but you can only take it so far until you get either neighborhood buy in or provincial buy in. Tobacco being the best of the examples, where we found we'd taken tobacco reduction, tobacco cessation, tobacco policy as far as we can within the region, until such time as there's a strong, a willingness to do it at a provincial level." (medium capacity, initiation stage)
>
> "All they're [The board are] told is that they have to do is balance the budget. It's the only thing they have to do. They're not told that they have to improve people's health." (medium capacity, initiation stage)
>
> "Successful example[of], health promotion might include community members. Ah, we actually had this happen so it was very exciting, coming forward and saying we want to get a, a smoking by-law passed, and can you help us?" (low capacity region, initiation stage)

5.3.3 Qualitative document review of business plans and annual reports

Review of the business plans and annual reports indicated that regions spend on average 4.9% of their budget on Promotion, Prevention and Protection Services, with a range from 2.5% to 7.5% (see Appendix 7). However the health promotion part of this is

considerably less since Promotion, Prevention and Protection services includes a wide range of public health programs such as communicable disease prevention, immunization as well as injury prevention.

Based on their business plans, most RHAs had adopted a broad definition of health, with many of the business plans contained explicit references to provincial health goals. The will to do health promotion was seen in the goal to "Encourage and promote healthy Living" in 9 of the RHA business plans, congruent with Alberta Health and Wellness stipulation of a core business requirement. It was interesting to note that 5 health regions interpreted this as individuals "taking a personal responsibility" or "promoting responsible lifestyle choices" and 2 regions indicated their goal was to provide "health information to help understand what makes them healthy". However, there was little evidence that the regions had gone beyond adopting the broad definition of health to develop concrete policies, objectives and strategies that are linked to the determinants of health. Most of the focus of the business plans and annual reports were on the provision and delivery of health services.

There was variability in the amount of leadership for health promotion evident within RHA business plans and annual reports. In regions with higher capacity for health promotion, medical officers of health (MOH) were key members of the senior management team and community health councils were active and had a specific health promotion mandate. Whereas in regions with lower capacity for health promotion, MOHs were available on a consultant basis only and community health councils were nonexistent or had difficulty gaining community input.

There was greater evidence of RHA involvement in addressing smoking (inventory of smoking programs has been published elsewhere, (Wolbeck Minke, 2006), than nutrition (Table 5.5), which was higher than physical activity (Table 5.6).

Medium and high capacity regions had extensive partners with community agencies, schools, and post-secondary colleges and universities, with high capacity regions also

partnering with industry and workplaces. In contrast low capacity regions had limited involvement in partnering. Many nutrition programs available in health regions were the result of a federal or provincial lead program such as the Canada Nutrition Prenatal Program, Alberta Cancer Board 5 a day program, or the Alberta Mental Health board provincial Eating Disorders program.

As summarized in Table 5.5, most of the focus of RHA nutrition programs was related to developing personal skills of individuals through education (classes, resources, displays) and to a lesser extent through demonstrations and tours. Twelve of the seventeen regions (70%) indicated availability of a non-diet wellness program approach to health eating. The high capacity regions used mass media to broaden the reach of their nutrition education programs. Some work was being done in regions on strengthening community action through development of collective kitchens, school breakfast and lunch programs. Examples of work being done on creating supportive environments for healthy eating were limited to hospital cafeterias. One medium capacity region indicated that they had restructured the Nutrition Services department to reflect program management into areas such as Risk Reduction and the continuum of care rather than site based care. This same region also indicated in their business plan the difficulty with reorienting some acute care rural hospitals to community health centers due to the concern "of serious economic repercussions due to job loss and perceived lessening of health services" (medium capacity health region). No region indicated they were involved in advocating for nutrition policy.

In contrast, as summarized in Table 5.6, most of the focus of RHAs regarding physical activity programs was related more to strengthening community action, creating supportive environments and building healthy public policy, rather than developing personal skills.

5.4 Discussion

This study provides insight to how nutrition is implemented by regional health authorities from a health promotion perspective. The role of poor diet as a risk factor for cardiovascular disease was recognized, with those in leadership positions reporting a high level of organizational knowledge and confidence in addressing poor diet in development of cardiovascular disease. Overall the health regions were focused on developing personal skills and strengthening community action, with less involvement in creating supportive environments and reorienting nutrition services, and no involvement in developing healthy public nutrition policy.

Analysis of the semi-structured interviews and focus groups and document review indicated most health regions were involved in nutrition programs focused on developing personal skills of individuals in the community. However a focus on education regarding risk factors for cardiovascular disease is limiting for a number of reasons. Knowledge-based nutrition education programs alone do not result in dietary behavior change (Contento, 1995), and do not address the social and environmental issues involved in healthy eating. A study of individuals with symptoms of cardiovascular disease, indicated that those of lower SES status in spite of a higher incidence of heart disease are reluctant to seek care due to self blame and fear they would be held responsible for their risk behaviors (Richards, 2002). This is similar to the findings reported by Travers (1996) that nutritional messages regarding healthy eating do not assist the disadvantaged but rather promotes a sense of guilt and inadequacy. Instead, financial limitations on 'healthy eating' messages for those in poverty need to be better recognized (Attree, 2006).

Although there was a strong belief by RHAs that environmental/psychosocial risk factors should be addressed, involvement was low. An example from the medium capacity health region indicated one explanation for low involvement by RHAs on poverty, was after the health region had gathered demographic information on low-income status in their region and met with the community members to discuss, there was denial by the community members that poverty existed in their community. This is not surprising

since low-income people are less likely to participate in community events and activities (Stewart, 2004), and thus community members may not be aware of the issues. Ongoing communication to RHAs regarding effects of poverty on nutritional health need to be done, particularly in Alberta where food insecurity and food-bank use has increased 30% between 1997 and 2003, which may be due in part to rising housing and utility costs (Orchard, 2003).

Some of the key informants from the medium capacity regions shared their experiences with developing personal skills of healthcare providers and the board to undertake health promotion. As Dulworth (Dulworth, 2003) has indicated, board education which focuses on pertinent healthcare market information and strategic directions and priorities can be a strategic asset in healthcare.

Key informants in the high and medium capacity regions recognized that there are both benefits and costs to strengthening community action with the development of partnerships. This is similar to the finding in the Canadian Heart Health Initiative - Ontario Project that inter-agency groups rarely came together without a pre-determined issue or lead agency which was often the health region (Robinson, 2000). Although the guidelines from Alberta Health and Wellness regarding RHA business plans and annual reports suggest RHAs partner with not only other providers of health services, but also other ministries, other levels of government and the private sector (Alberta Health & Wellness, 2000, pg 7), the low capacity health regions had limited partnerships due to limited resources.

Successful community intervention programs combine media and communication messages with broad-ranged community activities involving primary health care, voluntary organizations, food industry and grocery stores, workplaces, and schools (Puska, 2002). However, RHAs' involvement in addressing nutrition-related and physical activity-related activities across a variety of settings or 'environments' is low. Most of the focus is on institutions such as healthcare and schools, and is limited across a broad based community settings. Nutrition involvement in restaurants, grocery stores

and workplaces occurred on a "seldom" to "occasional" basis. In the intensive assessment of one medium capacity health region, the role of a health region in workplace and community settings was questioned, although the AHHP demonstration phase had included projects in workplaces and community settings.

Overall there was limited involvement in creating supportive environments for heart health nutrition. The difficulty the low capacity region, a rural region, had with creating supportive environments for healthy eating was similar to findings from other rural regions where people are more likely to eat fried and fatty foods and less likely to eat the recommended 5-10 servings of fruits and vegetables per day than those living in urban areas (Johnson, 1995) due to lack of availability and access (Paluck, 2006). Suggestions for expanding availability of healthy choices include regular monitoring and publishing prices of healthy food choices in grocery stores (Webb, 2001), advocating for increased availability of healthy low cost foods such as bulk foods (Travers, 1996) and locally grown produce in grocery stores, and training for restaurant personnel regarding healthy food preparation (Keystone Forum, 2006).

There were limited examples of RHA participation in reorienting nutrition services. One study in the literature indicated the benefits of restructuring dietitians to reflect the continuum of care including home and community care (Patch, 1999).

There was little involvement by the RHAs in building healthy public policy outside smoking bylaws. More work needs to be done as indicated by a key informant from a high capacity health region indicated regarding RHAs role in building healthy public policy. For example food policies at the local community level relating to healthy school food and food security are important. Evidence-based strategies to address food security at the community level include advocating for more affordable housing, develop land use policies that facilitate agriculture in urban settings and use tax incentives and financing mechanisms to attract local food businesses to low-income neighborhoods (McCullum, 2005).

The difficulty the low capacity region experienced in implementing heart health promotion due to demands of the immunization programs indicates the difficulty heart health promotion programs face when competing with other priorities in the region (Elliott, 2000). It also indicates inadequate infrastructure such as resources (Wolbeck Minke et al, 2006), since some of the activities from the AHHP demonstration phase were discontinued when project funding ended (Royall, 2003). Also detracting from intra-organization collaboration between acute care services and health promotion is a lack of a common language between disease treatment and the capacity building or empowerment framework of health promotion (Smith, 2001).

Collectively, the three studies showed support for the link between stages in the diffusion of innovations of health promotion in organizations and among practitioners. Organizations exhibiting low capacity were at the initiation stage for many health promotion actions where they recognized a need for health promotion action, but lacked the leadership, political will and infrastructure to implement heart health promotion. In contrast, organizations exhibiting high capacity had moved beyond making decisions about health promotion and many health promotion actions were part of ongoing organizational activities. Among practitioners, practicing dietitians with less access to resources (e.g. infrastructure and leadership) were similarly at an initial knowledge stage with regard to health promotion, while managers were more likely to have moved beyond persuasion , and with a supportive organization had moved towards implementation of heart health promotion innovations.

The finding that those in more senior management or leadership positions demonstrated greater organizational knowledge and confidence in addressing risk factors, is similar to the findings of Singer and colleagues (Singer, 2003) who reported a discordance between senior management and front-line workers regarding patient safety issues which they speculated could reflect a tendency for front-line workers or middle managers to gloss over problems and service gaps in briefings to senior managers.

Although Attree (2006) conducted a review of UK public health policies in relation to diet and nutrition, and Lachat (2005) completed a document review of national policy plans on nutrition in the European Union, content analysis from any perspective of hospital business plans was not found in the literature. The lack of information on review of hospital business plans could be due to two reasons. First a study indicated that 47% of hospitals surveyed did not have a strategic or business plan (Jayasuriya, 1998). Second, as Wong (2004) indicates, locating qualitative research in the literature can be difficult since it represents a small proportion of the total biomedical literature published each year, and inconsistent indexing limits search strategies.

Integrating document review with interview and focus group data is important since participants in focus groups may have been influenced by a social desirability bias, with participants describing what they thought the researcher wanted to hear rather than actual events. There were consistent findings between multiple data sets providing increased confidence in the credibility of the study findings. Incorporation of both quantitative and qualitative research approaches is also important for qualitative data to give voice to patient or provider in the healthcare decision making process (Wong, 2004).

5.4.1 Implications for practice

Given the limited development of specific objectives and strategies addressing the determinants of health, more specific indicators may need to be stipulated in the provincial requirements of RHA reporting. Since "what gets measured gets done" is a well known adage in performance measurement (Behn, 2003). As Nutbeam (1999) suggests, indicators to measure the outcomes of health promotion in the areas of strengthening community action could include community participation, and public opinion, and in building health public policy could include policy statements, legislation and resource allocation. Development of a minimum data set on indicators relating to the determinants of health would facilitate comparison and identify areas for growth.

Diffusion of innovations theory can be used to develop strategies to increase the implementation in RHAs of heart health nutrition programs with a health promotion approach. One strategy would be to work on the innovation, such as the development of 'best practices' for heart health promotion and in nutrition in heart promotion. Most of the AHHP demonstration phase projects were directed at 3 of the health promotion actions of the Ottawa Charter: developing personal skills, strengthening community action, and creating supportive environments (Thurston, 1999) and did not include reorienting health services or developing healthy public policy. Whereas, in Ontario, a provincial nutrition resource center exists with the goal to increase the capacity of Ontario's nutrition practitioners to implement nutrition programs in a health promotion context through coordinated provincial support for nutrition promotion programming, resource development and dissemination (http://www.nutritionrc.ca/about.html, retrieved September 28, 2006). This nutrition resource center is unique in that it includes resources and programs that address all aspects of health promotion (e.g. examples and tools for nutrition policy change) and not just resources for education or developing personal skills. Evaluation of the Ontario health promotion resource system indicated there was a strong association between the health promotion capacity of individual practitioners and access and use of the resource centres (Rush, 2002). In contrast to a best practice approach, others have argued for more of generalist approach and that health promotion programming is "more of a process that has to be shaped to the reality of a particular community, than a product to be imported and imposed" (Hanusaik, 2003, pg. 416).

Regardless of a specialist or generalist perspective, knowledge of health promotion will not lead to change. As Whitelaw (Whitelaw, 2006) emphasizes any implementation strategy based simply on the uncoordinated dissemination of a tool or resource will have a weak impact. Communication is needed along with leadership, political will, and infrastructure to achieve widespread practice and policy change (Green, 2006, Anderson, 2005). This is consistent with Roger's work on diffusion of innovations (Rogers, 1995) regarding the role of communication channels and key individuals in facilitating exchange between those who develop innovations and those who adopt them (Robinson,

2005). Indeed RHA focus group participants requested a need for increased communication and collaboration (Wolbeck Minke, 2006).

5.4.2 Limitations

Member checking to validate the themes emerging from the interviews and focus groups was not done, due to the concern of a potential threat to confidentiality and anonymity when individual qualitative data are shared back with group members and individual respondents' identities may be revealed.

Document review occurred after the analysis of interviews and focus groups and was useful to confirm themes that emerged from discussions with key informants. However since the document review occurred after the interviews and focus groups were conducted, there was no opportunity to explore themes emergence from the analysis of business plans and annual reports. For example, it was interesting to note the widespread implementation of a 'non-diet' wellness program for healthy eating, and it would have been interesting to explore the factors influencing the adoption of the program. Research regarding the 'non-diet' approach has shown improvement in psychological and eating variables and slight improvements in some blood cholesterol measurements; however, no change in weight in comparison with diet groups (Bacon, 2002 and Bacon, 2005). Thus one could question whether the adoption of a non-diet program approach is considered to be best-practice and might be considered inappropriate dissemination. Likewise a recent survey of Canadian dietitians indicated all respondents were using components of solution focused counseling in their outpatient practices, however the efficaciousness of solution focused counseling in dietetic practice has yet to be determined (Wunch, 2006).

This study appraised the content of the business plans and annual reports and the implementation of nutrition in RHAs from 2000 - 2004. Since then there may have been additional progress in implementation of nutrition in heart health promotion due to the emergence of new nutritional challenges, new evidence or changes in the political landscape.

5.4.3 Conclusions

This study provides a unique descriptive example of the complexity in addressing both behavioral and environmental/psychosocial risk conditions for heart health at the organizational level and provides insights into adoption of nutrition in heart health promotion by health regions. Factors associated with increased capacity for nutrition in health promotion included will, and leadership by the region and community, and infrastructure, where staff, resources and partnerships for health promotion exist. Increased opportunities for communication and organizational learning regarding nutrition implementation strategies amongst health regions is needed.

Despite growing support for a health promotion approach to nutrition interventions in addressing cardiovascular disease, gaps remain in implementation of nutrition in heart health promotion in regional health authorities. Like the initial approach to tobacco control, nutrition activities are primarily focused on efforts to influence individuals through public education and developing personal skills. To a lesser extent, health regions are involved in strengthening community action and creating supportive environments. Little work is being done in reorienting nutrition services or developing healthy nutrition policy. Nutrition programs addressing heart health in regional health authorities need to be broadened to include all aspects of health promotion.

Table 5.1. Alberta Heart Health Project data collection timeline

	2000 (Baseline)	2001 Year 2	2002 Year 3	2004 Year 4
Number of health regions	17	17	16	9
Survey respondents	N= 144/158 91% response rate from 17 RHAs 56 service providers, 58 senior/middle managers, 30 board members	N= 133/ 158 84% response rate from 16 RHAs 45 service providers, 51 senior/middle managers, 19 board members	N=82/ 158 51% response rate from 13 RHAs 40 service providers, 33 senior/middle managers, 17 board members	N=73 12 RHAs 6 board members, 31 service providers, 36 senior/middle managers.
Document review			Review of Business Plans and Annual Reports	
Interviews and focus groups		24 semi-structured interviews	Focus groups in 2002 and 2003	
Intervention		Self-assessment Feedback Education Intervention	Self-assessment Feedback Education Intervention in 2002 and 2003	Self-assessment Feedback

Figure 5.1 Model of capacity building from Smith C, Raine, Anderson D, Dyck R, Plotnikoff R, Ness K, McLaughlin KK. A preliminary examination of organizational capacity for heart health promotion in Alberta's regional health authorities. *Promotion and Education*, 2001; S: 40-43.

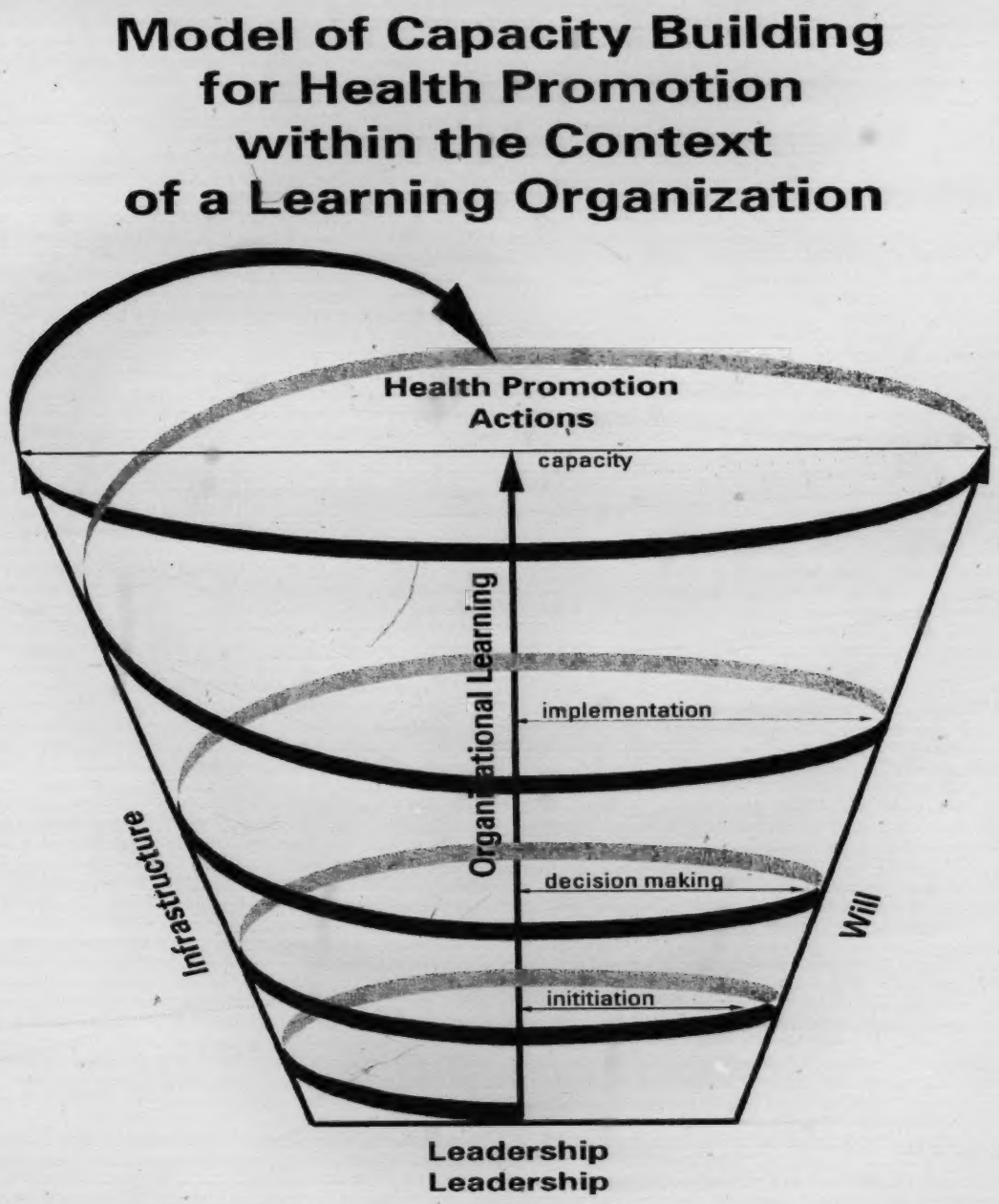


Table 5.2. Organizational capacity of regional health authorities to address risk factors and conditions. Mean (±SD) for level of knowledge, involvement, belief and ability (2000 – 2004).

	Baseline (2000)	**Year Two (2001)**	**Year Three (2002)**	**Year Four (2004)**
Variable	n= 144	n=133	n=90	n=73
Knowledge of risk factors.				
Physiological	4.21 ±0.73	4.10 ± 0.68 [a]	4.26 ± 0.63	4.43 ± 0.58 [a]
Behavioral	4.53 ± 0.53	4.57 ± 0.51	4.62 ± 0.51	4.66 ± 0.46
Psychosocial	3.18 ± 0.86	3.09 ± 0.86 [a]	3.39 ± 0.90	3.48 ± 0.87 [a]
Environmental	2.73 ± 0.92 [d]	2.71 ± 0.95 [a]	3.01 ± 0.96	3.1 ± 1.01 [ad]
Belief should address				
Physiological	4.36 ±0.55	4.49 ± 0.57	4.53 ± 0.52	4.54 ± 0.47
Behavioral	3.98 ±0.69	4.10 ± 0.76	3.99 ± 0.70	4.66 ± 0.45
Psychosocial	4.12 ± 0.64	4.17 ± 0.76	4.11 ± 0.66	4.16 ± 0.72
Environmental	4.14 ± 0.69	3.85 ± 0.80	4.02 ± 0.80	3.88 ± 0.76
Confidence to address				
Physiological	4.09 ±0.72	4.05 ± 0.74	4.26 ± 0.58	4.28 ± 0.63
Behavioral	4.16 ±0.79	4.03 ± 0.82 [ab]	4.32 ± 0.59 [b]	4.35 ± 0.68 [a]
Psychosocial	3.34 ± 0.85	3.23 ± 0.79	3.46 ± 0.75	3.5 ± 0.87
Environmental	2.96 ± 0.86	2.97 ± 0.83	3.10 ± 0.81	3.09 ± 1.08
Level of involvement				
Physiological	3.64 ± 0.95	3.55 ± 0.86 [ab]	3.87 ± 0.76 [b]	3.97 ± 0.77 [a]
Behavioral	4.16 ± 0.79	4.03 ± 0.82 [ab]	4.32 ± 0.59 [b]	4.35 ± 0.68 [a]
Psychosocial	2.82 ±0.85	2.67 ± 0.84 [a]	2.89 ± 0.74	3.11 ± 0.88 [a]
Environmental	2.18 ± 0.72 [d]	2.26 ± 0.84 [a]	2.37 ± 0.83	2.64 ± 0.96 [ad]

ANOVA: Means with the same superscript letters are significantly different at $p < 0.05$.; [a] year 2 and year 4; [b] year 2 and year 3; [c] baseline and year 3, [d] baseline and year 4, [e] year 2 and year 4, [f] year 3 and year 4. See Table 5.2 b for details.

Five-point Likert-type scale categories were provided for each item, resulting in a lowest possible score of "1"(e.g. Strongly Disagree/None) and highest possible score of "5" (e.g. Strongly Agree, Regularly).

Table 5.2b. Analysis of variance for comparison of risk factor categories

	Base	Year 2	Year 3	Year 4	F for the ANOVA	p- value for the ANOVA	Levene Statistic	p – value for Levene statistic	Post Hoc p value
Knowledge									
Physio-logical	4.21 ±0.73	4.10 ±0.68	4.26 ±0.63	4.43 ±0.58	3.721	.012	1.622	.183	B vs. Y2 p = 1.000 B vs. Y3 p =1.00 B vs. Y4 p = 0.164 Y2 vs Y3 p = 0.530 Y2 vs Y4 p = 0.006* Y3 vs Y4 p = 0.722
Behav-ioral	4.53 ±0.53	4.57 ±0.51	4.62 ±0.51	4.66 ±0.46	1.456	.226	2.117	.097	
Psycho-social	3.18 ±0.86	3.09 ±0.86	3.39 ±0.90	3.48 ±0.87	4.114	.007	.471	.702	B vs. Y2 p = 1.000 B vs. Y3 p =0.452 B vs. Y4 p = 0.112 Y2 vs Y3 p = 0.080 Y2 vs Y4 p = 0.017* Y3 vs Y4 p =1.000
Environ-mental	2.73 ±0.92	2.71 ±0.95	3.01 ±0.96	3.1 ±1.01	4.328	.005	.249	.862	B vs. Y2 p = 1.000 B vs. Y3 p =0.216 B vs. Y4 p = 0.027* Y2 vs Y3 p = 0.179 Y2 vs Y4 p = 0.023* Y3 vs Y4 p =1.000

continued

	Base	Year 2	Year 3	Year 4	F for the ANOVA	p- value for the ANOVA	Levene Statistic	p – value for Levene statistic	Post Hoc p value
Belief									
Physio-logical	4.36 ±0.55	4.49 ± 0.57	4.53 ± 0.52	4.54 ± 0.47	2.664	.048	2.019	.111	B vs. Y2 p =0.292 B vs. Y3 p =0.144 B vs. Y4 p = 0.143 Y2 vs Y3 p = 1.000 Y2 vs Y4 p = 1.000 Y3 vs Y4 p =1.000
Behav-ioral	3.98 ±0.69	4.10 ± 0.76	3.99 ± 0.70	4.66 ± 0.45	.834	.476	2.175	.090	
Psycho-social	4.12 ± 0.64	4.17 ± 0.76	4.11 ± 0.66	4.16 ± 0.72	.227	.878	1.529	.206	
Environ-mental	4.14 ± 0.69	3.85 ± 0.80	4.02 ± 0.80	3.88 ± 0.76	1.045	.372	0.500	.682	

continued

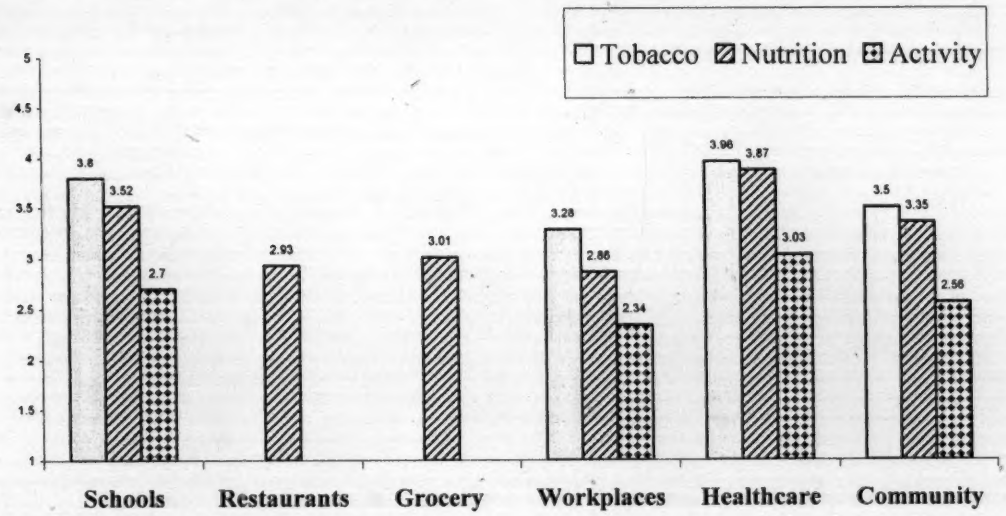
	Base	Year 2	Year 3	Year 4	F for the ANOVA	p- value for the ANOVA	Levene Statistic	p – value for Levene statistic	Post Hoc p value
Confidence									
Physio-logical	4.09 ±0.72	4.05 ± 0.74	4.26 ± 0.58	4.28 ± 0.63	2.936	.033	0.628	.597	B vs. Y2 p = 1.000 B vs. Y3 p =0.411 B vs. Y4 p = 0.305 Y2 vs Y3 p = 0.165 Y2 vs Y4 p = 0.125 Y3 vs Y4 p =1.000
Behav-ioral	4.16 ±0.79	4.03 ± 0.82	4.32 ± 0.59	4.35 ± 0.68	3.938	.009	1.356	.256	B vs. Y2 p = 1.000 B vs. Y3 p =0.692 B vs. Y4 p = 0.415 Y2 vs Y3 p = 0.039* Y2 vs Y4 p = 0.023* Y3 vs Y4 p =1.000
Psycho-social	3.34 ± 0.85	3.23 ± 0.79	3.46 ± 0.75	3.5 ± 0.87	2.202	.087	1.018	.384	
Environ-mental	2.96 ± 0.86	2.97 ± 0.83	3.10 ± 0.81	3.09 ± 1.08	.719	.541	3.441	.170	

continued

	Base	Year 2	Year 3	Year 4	F for the ANOVA	p- value for the ANOVA	Levene Statistic	p – value for Levene statistic	Post Hoc p value
Frequency									
Physio-logical	3.64 ± 0.95	3.55 ± 0.86	3.87 ± 0.76	3.97 ± 0.77	4.948	.002	1.724	.161	B vs. Y2 p =1.000 B vs. Y3 p =0.271 B vs. Y4 p =0.051 Y2 vs Y3 p =0.045* Y2 vs Y4 p =0.007* Y3 vs Y4 p =1.000
Behav-ioral	4.16 ± 0.79	4.03 ± 0.82	4.32 ± 0.59	4.35 ± 0.68	3.938	.009	1.356	.256	B vs. Y2 p = 1.000 B vs. Y3 p =0.692 B vs. Y4 p =0.415 Y2 vs Y3 p = 0.039* Y2 vs Y4 p = 0.023* Y3 vs Y4 p = 1.000
Psycho-social	2.82 ±0.85	2.67 ± 0.84	2.89 ± 0.74	3.11 ± 0.88	4.293	.005	1.297	.275	B vs. Y2 p = 0.948 B vs. Y3 p =1.000 B vs. Y4 p =0.096 Y2 vs Y3 p = 0.404 Y2 vs Y4 p = 0.003* Y3 vs Y4 p =0.566
Environ-mental	2.18 ± 0.72	2.26 ± 0.84	2.37 ± 0.83	2.64 ± 0.96	5.316	.001	1.840	.139	B vs. Y2 p = 1.000 B vs. Y3 p = 0.520 B vs. Y4 p =0.001* Y2 vs Y3 p = 1.000 Y2 vs Y4 p = 0.012* Y3 vs Y4 p =0.258

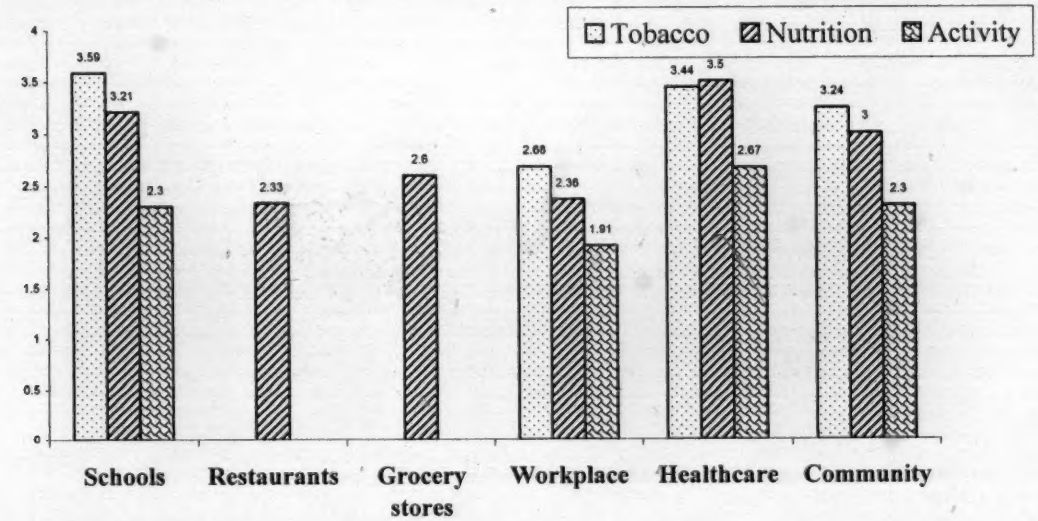
B= Baseline, Y1 = Year 1, Y2 = Year 2, Y3 year 3, Y4 = year , * The mean difference is significant at the 0.05 level

Figure 5.2a. Mean score distribution for organizational ability to conduct tobacco, nutrition, and physical activity-related activities in various settings, year 2001 (n=133).



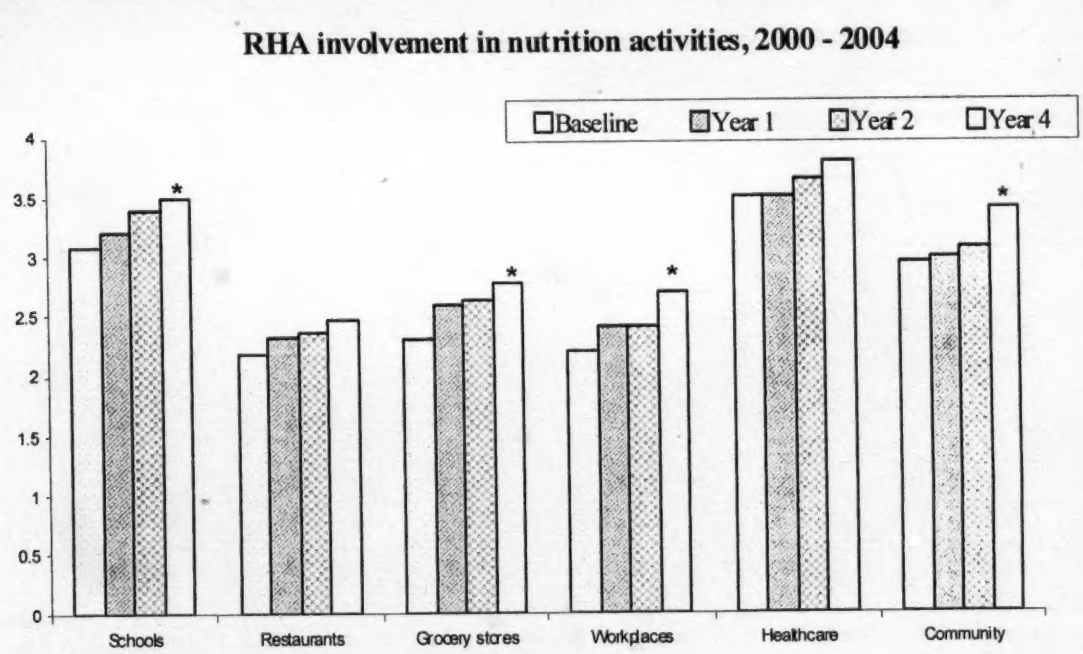
Five-point Likert-type scale category ranged from a low ability score of "1" (e.g. poor) to high ability of score"5" (e.g. excellent).

Figure 5.2b. Mean score distribution for current organizational involvement in tobacco, nutrition, and physical activity-related activities in various settings, year 2001 (n=133).



Five- point Likert type scale category ranged from a low current involvement of "1" (e.g. none) to high current involvement score of '5' (e.g. regularly).

Figure 5.3. Regional Health Authority involvement in nutrition activities in various settings, 2000 - 2004



* $p < 0.05$ between baseline and Year 4, statistically significant

Five-point Likert-type scale categories were provided for each item, from an involvement score of "1"(none), "2" (seldom), "3" (occasionally), "4" (often) to a score of "5" (regularly).

Table 5.3. Comparison of position level and organizational knowledge, belief, confidence and involvement in addressing behavioral risk factors, year 2001 (n=133).

	Total	Board n=21	Management n=57	Service Provider n=48	F value for the ANOVA	p value for the ANOVA	Post Hoc p value
Knowledge							
smoking	4.31	4.55	4.43	4.08	4.923	0.009	B vs M p=1.000 B vs SP p= 0.32 M vs SP p=0.027*
poor diet	4.08	4.25	4.21	3.85	3.214	0.044	B vs M p=1.000 B vs SP p = 0.179 M vs SP p=0.070*
physical inactivity	4.03	4.29	4.17	3.75	4.843	0.009	B vs M p=1.000 B vs SP p=0.036 M vs SP p=0.027*
Belief							
smoking	4.71 ± 0.54	4.89 ±0.30	4.68 ± 0.45	4.66 ± 0.68	1.469	0-.234	
poor diet	4.61 ± 0.58	4.64 ± 0.47	4.57 ± 0.51	4.65 ± 0.69	0.238	0.789	
physical inactivity	4.57 ±0.65	4.56 ± 0.59	4.57 ± 0.61	4.59 ± 0.74	0.013	0.988	
Confidence							
smoking	4.21 ±0.84	4.53 ±0.49	4.28 ± 0.74	3.99 ±1.01	2.365	0.038	B vs M p=0.755 B vs SP p = 0.049* M vs SP p=0.230
poor diet	4.05 ±0.90	4.43 ± 0.59	4.03 ± 0.74	3.92 ± 1.12	2.308	0.104	
physical inactivity	3.85 ±0.98	4.28 ±0.63	3.85 ± 0.85	3.68 ±1.18	2.702	0.071	
Frequency							
smoking	3.89 ±0.94	4.16 ±1.12	3.97 ± 0.84	3.69 ± 0.95	2.171	0.118	
poor diet	3.62 ± 0.95	3.77 ± 1.2	3.65 ± 0.81	3.54 ± 1.00	0.458	0.633	
physical inactivity	3.16 ± 0.99	3.37 ± 1.09	3.11 ± 0.92	3.15 ± 1.04	0.534	0.587	

B = Board, M = Senior /Middle Management, SP = Service Provider

* The mean ± SD difference is significant at the 0.05 level

Table 5.4. Themes from semi-structured interviews (n=24) with key informants in regional health authorities regarding nutrition in heart health promotion.

Health Promotion Action Means	Innovation process in Regional Health Authorities		
	Initiation Phase	**Decision**	**Implementation**
Nutrition Heart Health Promotion Action Perceptions of a High capacity region			
Develop Personal Skills	-recognition of the need to improve nutrition health promotion skills of physicians and dietitians	- decision to address inactivity and poor diet, in a high risk population	- using mass media to provide healthy eating messages, and healthy food preparation demonstration
Reorient Health Services		- decision by the board to be a health-promotion driven organization	health promotion is incorporated through all aspects of service delivery
Strengthen Community Action			-working with community partners is the way of doing business - partner with industry, community groups and education institutions
Create Supportive Environments	-recognition that nutrition education alone will not change behavior		
Build Healthy Public Policy	- recognition that RHA CEOs could be more influential in building healthy public policy		- RHA executive took a leading role in changing the smoking bylaw
Health Promotion Action Perceptions of a Medium capacity region			
Develop Personal Skills	- need more programs that develop healthy eating skills		- aboriginal healthy eating resources have been regularized into the RHA budget - provide some education and training for healthcare providers regarding nutrition and determinants of health (e.g. poverty).
Reorient Health Services	Board has adopted the determinants of health framework, but senior management question the evidence for heath promotion		- some dietitian positions have been changed into half health promotion and half clinic work - continue to offer and promote a weight loss program
Strengthen Community Action	- could do more about physical activity and nutrition, plan to develop an obesity initiative	-decided in collaboration with the food bank to develop a community kitchen	- see community partnerships as a way of expanding limited resources - partner with community and

			education institutions
Create Supportive Environments	- used to have heart health fairs and heart smart restaurant program - recognition of the need to have restaurants that serve healthy food - questioning whether RHA should be involved in workplace wellness		- used the 5-a day Fruit & Vegetable promotion program resources from Albert Cancer for some grocery store and mall and restaurant displays - developed school food program
Build Healthy Public Policy	- reservations about taking lead on building healthy public policy		
Health Promotion Action Perceptions of a Low capacity region			
Develop Personal Skills	- see need for more nutrition education in schools - see health centers as providing education and support for lifestyle changes		
Reorient Health Services	-recognize need to reorient health services, but lack political will - addressing environmental risk factors is politically risky	- changed the reporting structure, nutrition now under health promotion	
Strengthen Community Action	- recognize more could be done with partners but lack resources	-previously involved with development of community kitchens - previously involved in promoting heart health in Hutterites	
Create Supportive Environments	- indicate unhealthy foods in schools are needed for fundraising - recognize need to promote healthier catering		
Build Healthy Public Policy	- board member reluctant to influence school food policy - a community member took lead on smoking bylaw change rather than the RHA		

Table 5.5 Examples of **Nutrition** Related Activities in RHA Business Plans and program activities survey

RHA	Programs/ Partnerships
High capacity (n=5)	• Hosting radio spots to promote health promotion and prevention education (focus on fruits and vegetables) newspaper articles (DASH diet, nutrition labeling, obesity) • provide nutrition education to schools and children's programs, school lunch program • healthy heart classes, grocery store tours, meal planning classes, displays (using Alberta Cancer board materials on 5 a day –intake of fruits and vegetables) • increasing healthy food choices in hospital cafeteria, and providing point of purchase nutrition information • Partner with local College to provide a course on "Lifestyles which focuses on healthy eating and physical fitness • non-diet /size acceptance approach to healthy eating, eating disorders program • participate in the Canada Nutrition Prenatal Program regarding maternal/infant nutrition
Medium capacity (n=6)	• Promote and support healthy nutrition and eating and implementation of the Alberta Cancer Board's Simply Healthy program which addresses the need to increase consumption of fruits and vegetables. • collective kitchens, community nutrition & school breakfast programs • developed Healthy Lifestyles calendar regarding classes • developed First Nations Healthy Choice recipe book • Alberta Mental Health Board provincial Eating Disorders Program, non-diet /size acceptance approach to healthy eating • participation in the Canada Nutrition Prenatal Program regarding maternal/infant nutrition
Low capacity (n=6)	• collective kitchens • Alberta Mental Health Board provincial Eating Disorders Program. non-diet /size acceptance approach to healthy eating • participation in the Canada Nutrition Prenatal Program regarding maternal/infant nutrition

Table 5.6 Examples of **Physical Activity** promotion in RHA Business Plans and program activities survey

RHA	Programs/ Partnerships
High capacity	• Energy in Action directed at 30-50 year old males to encourage an active, heart healthy lifestyles, surveyed, mailed out Canada's Physical Activity Guide, compiled inventory of physical activity events in the community. • Combine the resources of the Energy in Action and the Cardiac Education committees to develop a comprehensive community activity program 2002-2004 • advocate for creation of supportive environments, support municipalities to develop environments that foster active living (e.g. supported development of an expanded trail system). • supported Council of Medical Officers of Health (COMOSH) to develop a position paper on daily physical education for kindergarten to grade twelve, the paper advocates for policy change.
Medium capacity	• surveyed residents regarding physical activity • Active Transportation committee formed to address decreasing levels of activity among young people and the negative affect on health and quality of life. The purpose is to increase awareness of the importance of physical activity and to determine the barriers that exist to increasing activity. The schools , local college, Fitness Resource Centre, and Safe Community Coalition are participants on this committee. • support "Be Fit For Life" program offered through the local community college, which offers a range of fitness and lifestyle resources
Low capacity	• Plan to collaborate with schools to advocate for increasing physical activity.

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CHAPTER 6: DISCUSSION

6.1 Introduction

This chapter summarizes the major findings from the studies contained in chapters three, four and five. This chapter relates the studies to each other, and to the fields of health promotion, evidence-based practice and diffusion of innovations theory. The research findings increase understanding of how nutrition evidence is implemented in practice from both an individual and organizational perspective. Recommendations for policy and practice and further research are presented in relation to the literature in the areas of health promotion, guideline development, dietetic practice and health regions.

6.2 Major Findings

There is a considerable amount of evidence available regarding nutritional strategies to reduce the burden of cardiovascular disease. The purpose of this thesis was to explore how nutrition evidence is used by dietitians and regional health authorities in addressing cardiovascular disease. Nutrition evidence included implementation of nutritional aspects of heart health promotion, and a clinical practice guideline on treatment of dyslipidemia. Integral to the studies was the role of contextual influences in implementation of nutrition evidence in practice. In particular the context of practice, characteristics of the adopter, and characteristics of the organization influenced use of nutrition evidence in practice.

These studies suggest that despite the shift in focus of heart health promotion from attempting to change individual behavior (in the 1980s and early 1990s) to the acknowledgement of wider influences on health (in the late 1990s), individual responsibility for heart health remain the main area of focus for dietitians and health regions.

In the first study, *Heart health promotion: dietitians' perceptions and practices*, the context of dietitians' position and whether they were working at the provider or management level became evident. Dietitians had an incomplete understanding of health promotion concepts, with perceptions primarily focused on individualistic approaches of lifestyle and behavior changes, although dietitians working at the management level had more of population focus. Overall, dietitians reported they had a high degree of knowledge, belief, confidence and frequency in addressing physiological and behavioral risk factors, with a limited involvement in addressing psychosocial and environmental risk conditions.

Dietitians did recognize the need for individual empowerment for self-directed promotion of heart health. As others have indicated (Irvine, 2007) empowerment is fundamental to effective health promotion, to not only enable individuals and groups to develop healthy lifestyles, but to influence societal and environmental conditions that affect their health.

In the second study, *How dietitians utilize heart health research and guidelines in practice*, a qualitative approach was first used to explore the context of clinical and management situations on research use. Dietitians reported using research to support the content of nutritional care as compared to the process of care. This difference in research use was related to the dietitians' role and the amount of research available. Dietitians reported using research more in the context of providing usual care and were influenced by time constraints and availability of research.

Dietitians rated discussion with colleagues and review articles as the top sources of knowledge regarding research evidence and guidelines. Approximately three-quarters of dietitians reported implementation of the dyslipidemia guideline in their practice. The main barriers to guideline implementation related to infrastructure issues such as lack of time, lack of resources, and high workload.

In the third study, *Nutrition in heart health promotion in regional health authorities,* there was a partial implementation of nutrition health promotion concepts. Most of the

health regions were involved in nutrition programs focused on developing personal skills of individuals in the community, and to lesser extent on strengthening community action, however few regions were involved in creating supportive environments for healthy eating or building healthy nutrition public policy and reorienting nutrition services. Characteristics of overall capacity of regional health authorities regarding health promotion was associated with implementation of nutrition health promotion.

In comparing results from study one and study three, regional health authorities reported a greater knowledge, belief, confidence and frequency in addressing environmental risk conditions. This result is encouraging in that the environment in which dietitians work can foster development of a broader perspective. However, common to both the dietitian and RHA study, most emphasis was placed on developing personal skills, and strengthening community action, with some work done on reorienting health services. This is a similar finding to that recently reported by Frankish and colleagues (2007), which found in a survey of regional health authorities across Canada that the majority of health regions put the most focus on personal health practices. As others have noted the 'individualist ethic' continues to remain firmly entrenched in health care, where health research, practice, programs, and policies focus largely on determining personal risk factors for poor health and exhorting individuals to modify their behavior and lifestyle (Lee, 2003). However in addition to concerns about victim-blaming (Ryan, 1971), a focus on individual risk factors can overlook the underlying environmental conditions that contribute to the 'risky' behaviors (Lee, 2003).

More work needs to be done on creating supportive environments and healthy public policy, and in particular in developing skills to increase action in this area. Although there are strong recommendations for health practitioners to work across sectors to influence policy, practitioners do not necessarily have the skills or the time to participate in cross-sectoral processes (Armstrong, 2006).

Others have also noted that dietitians and health regions are reluctant to become involved in policy (Watts, 2006; Rideout, 2006). One of the explanation for lack of dietitian and health region involvement in policy development is the inherent tension between scientific knowledge and its application in the politically driven world of policy-making (Lee, 2003). For instance, scientists have difficulty extrapolating findings to a larger context, and policy makers find scientific evidence to provide inconclusive findings (Lee, 2003). Another explanation for lack of involvement in building healthy public policy, is that the determinants of health involves issues over which health authorities have limited influence such as community economic development (Rideout, 2006), however health regions can still have a leadership role in collaborating with other stakeholders to address these factors influencing the health of their region.

One of the key findings that emerged from these studies was the important role of management in implementation of evidence in practice. Unlike the origins of the Diffusion of Innovations theory developed by studying how evidence was put into practice by farmers and physicians, both autonomous 'practitioners', dietitians are more similar to nursing in that they function within an organizational context of which management plays a key role (Fink, 2005). Others have indicated that healthcare managers are well positioned to advance the research transfer process and suggest managers sharing documented stories that highlight strategies for addressing contextual circumstances, can help research transfer (Browman, 2003). Gowdy and colleagues (Gowdy, 2004, pg. 156) write "the role of the administrator has largely been overlooked . . . yet it may be the administrator's efforts to shape an organizational culture that is the driving force behind successful implementation of evidence-based structures and practices." The contextual influence of management on the implementation of research findings by individuals deserves greater attention and consideration with diffusion of innovations theory and studying how evidence is applied in practice.

Findings from these studies indicated differences regarding use of evidence in practice depending on position level in the organization. In all three studies, those working at a

management level reported greater understanding and implementation of nutrition in heart health. The greater reported ability of managers to implement nutrition evidence in practice may be due to their organizational position and access to increased infrastructure as well as their leadership role. The different perspective between managers and providers could also be due to managers not being aware of the complexities and gap in front-line service and may be due to middle management and service providers 'glossing over' practice programs (Singer, 2003). It could also mean that dietitians and regional health authority staff working at the service provider level are constrained by organizational influences in implementing research in practice.

Arising from all three studies and consistent with the Diffusion of Innovations theory (Rogers, 1995) was the importance of communication in adoption of an innovation. Communication with other dietitians and regional health authorities was an important influence on implementation of nutrition evidence in practice. Opportunities to develop networks between dietitians and regional health authorities would be important in sharing and implementing best practices regarding nutrition in heart health.

6.3 Limitations

Overall, the findings from these studies were conducted within the context of a regionalized health care system and are best generalized to similar settings. The collection and analysis of qualitative data requires time, resources, expertise and commitment, since a large amount of data was produced and reviewed. It takes considerable time to conduct the in-depth interviews, transcribe the interview tapes, add the interviewer notes and reflections to the transcribed interviews, conduct data analysis and summarize the results. These time demands also apply to those who participate as interviewees and in the feedback sessions. Overall the quantitative findings assisted in supporting the qualitative findings, and allowed exploration of the 'why' and 'how' behind the implementation of nutrition in heart health promotion. In regards to the quantitative findings, a ceiling effect was noted in regional health authority rating of their organizational knowledge, belief and confidence in addressing physiological and

behavioral risk factors for cardiovascular disease and thus there was little change over the years.

Common with other studies of diffusion of innovations there is the potential for a pro-innovation bias, a bias that innovations should be adopted by everyone and should be adopted 'as is' (Rogers, 1995). A pro-innovation bias was more pertinent to the dietitian study since the regional health authority study focused on diffusion of health promotion concepts rather than a complete entity such as a guideline. As well in the dietitian study that investigated individuals' use of research in practice, there is a potential for a bias of individual blame. Since as Meyer writes (Meyer, 2004, pg. 63) "this bias places blame for problems with individuals within the social system rather than with the social system itself."

6.4 Recommendations for policy and practice

6.4.1 Recommendations for development of guidelines

Differences were noted in frequency of use of guidelines. In the dietitian study, only 20% of respondents indicated they used the American Heart Association's Population based Guidelines at the Community Level (AHA, 2003) often or always. In contrast, 72% of dietitians reported using the Canadian Recommendations for Management of Dyslipidemia and Prevention of Cardiovascular Disease (CMAJ, 2003) on an often or always basis. There could be a number of interpretations of this difference; lack of awareness due to limited dissemination, absence of Canadian content, or lack of understanding of health promotion being applicable to their practice as the qualitative part of the dietitian study suggests. One strategy would be to incorporate health promotion concepts into disease based guidelines (Clark, 2004). Combining guidelines would also reduce the number of guidelines and perhaps reduce confusion from multiple guidelines (Lewis, 2001).

One strategy to improve implementation research would be to ensure routine incorporation of dissemination/implementation research findings into the clinical

guideline development process and final guideline recommendations (Dietitians of Canada, 2003). For example, if particular care models or change strategies, such as clinical reminders, have been shown to be effective for ensuring higher quality care for a given health problem, guidelines should incorporate the use of clinical reminders into the guideline recommendation.

Guidelines would benefit from having tailored intervention strategies for both clinicians and management with infrastructure and resource implications as well as suggestions for policy change. In addition, given the role of management in successful guideline implementation, an administrative perspective in the development of guidelines would be valuable.

6.4.2 Recommendations for dietetic practice

Traditionally dietitians have focused on individual-level interventions involving one-to-one interactions between themselves and a patient often in a clinical environment. However clinical services can be extended to include the family or social network (Ockene, 2007). The recognition that interventions at the family and community network level in community settings will facilitate behavior change and provide social support is important. As noted by others (Irvine, 2007), greater involvement in health needs assessment and community profiling, and advising on the delivery of health services will offer more opportunity to address the non-medical determinants of health. Finally involvement at the policy level will have the greatest impact across communities and populations (Ockene, 2007).

Further research is needed to determine the effects of nutrition policies on the availability of food, healthy eating behaviors and the nutritional health of the population. In particular better food and nutrition surveillance systems are needed to evaluate the impact of policy change.

6.4.3 Recommendations for dietetic education and training

One strategy to enable dietitians to develop skills in building public policy is to expose them to the policy development process as students. Nursing students report on gaining an understanding of the policy development process by participating in policy development at the national association level (Wicks, 2006).

Other areas dietitians would benefit from skill development are in counseling skills, how to develop focus groups, and how to work with community partners to improve the nutritional health of their population.

6.4.4 Recommendations for regional health authorities

One strategy to enable health regions to take action on health promotion strategies in addition to developing personal skills of individuals is to develop indicators that vary in scope from direct measures of individual behaviors to broad policy measures (Rideout, 2006). For example, having health regions monitor the accessibility and affordability of nutritious food in their region (e.g. cost of a healthy food basket), extent of emergency food sources, health authority representation on food policy councils, availability of grocery stores in low socio-economic neighborhoods, availability of perinatal nutrition programs is one way to make food security relevant to health regions (Rideout, 2006).

6.5 Recommendations for future research

One area for future research would be to audit dietitians' practices and provide feedback that includes peer comparison as a method for changing practice of dietitians. This approach tends to work because realistic goals that can be achieved by one's local peers are presented as a benchmark rather than the unattainable goal of "100% adherence to guidelines (Majumdar, 2004). Results of a systemic review of the effects of audit and feedback and professional practice have indicated that effects are small to moderate, and impact will be greater when baseline adherence to recommended practice is low (Jamtvedt, 2003). More recently, regarding guideline adherence to various disease states hospitals that scored higher on implementing clinical practice guidelines provided timely, individualized feedback (Hysong, 2006). However, as the process of developing an

infrastructure to audit performance and generate site reports is costly, its efficacy, by itself, needs to be further clarified to warrant use in future guideline implementation initiatives (Jain, 2006).

Other areas to explore would be to investigate the nature and extent of the social networks of dietitians and how these networks serve as channels for social influence and the reinvention and embedding of complex service innovations (Greenhalgh, 2004). For example studies could be done regarding the effect of participation in nutrition practice groups on implementing evidence in practice.

Another promising area for promoting the implementation of nutrition evidence in practice is the use of knowledge brokers. A knowledge broker is a person who facilitates the creation, sharing and use of knowledge in an organization. A knowledge broker connects those seeking knowledge with sources of tacit information, and thus, a knowledge broker may be ideally positioned to identify innovations or sources of innovation (University of Alberta, Knowledge Utilisation Studies Program, http://www.nursing.ualberta.ca/KUSP/Resources_BibDat_Champions.htm). In nursing, clinical nurse educators can function as 'intermediaries' in bridging communities of research and clinical practice (Milner, 2005), and in some health regions in Canada research dietitian positions have been created to promote/conduct practice-based research with the view of improving practice (Nasser, 2004). As Greenhalgh et al (2004) recommend research should be done on identifying individuals who act as boundary spanners among health service organizations, how might they be enabled and enhanced. In particular, Greenhalgh et al (2004) suggest future research should focus on what is the nature of informal inter-organizational networking in different areas of activity, and how can this be enhanced through explicit knowledge management activities, such as the appointment and support of knowledge workers and boundary spanners. Thus it would be useful to examine the effect of clinical nutrition educators and research dietitians as knowledge brokers or 'boundary spanners' and their effects on the uptake and implementation of research into practice.

Another area for consideration is the prioritization of funding for different types of research projects. For example in some provinces, specific funding is targeted towards research that evaluates changes in the health system, and provides an opportunity to evaluate the implementation of health promotion concepts in practice. Thus Green's assertion that "if we want more evidence-based practice, we need more practice-based evidence" applies here (Green, 2006). Given the importance of context on determining the success or failure of dissemination initiatives, in addition to information on the evidence, information on the context and practice situation is needed.

6.6 Conclusion

This thesis investigated the influence of context on use of evidence by individuals and organizations. Practitioners are often unaware of their beliefs and assumptions underlying their practice, even though their practice is affected by these issues (Kahan, 2001). Best practices in health promotion are only attainable if we are aware of dietitians and health regions beliefs and practices regarding health promotion. Both qualitative and quantitative methods were used to seek out and understand the way in which circumstances influenced evidence utilization. In agreement with other authors, context and confounders lie at the very heart of diffusion, dissemination and implementation of complex innovations (Greenhalgh, 2004).

Dietitians and health regions reported implementation of individual approaches to cardiovascular risk reduction such as developing personal skills, and addressing physiological, behavior, and psychosocial risk factors. There is a lack of awareness of health promotion concepts amongst dietitians, with dietitians reporting limited understanding of environmental risk conditions for cardiovascular disease. Health regions reported support for a health promotion approach however had limited involvement in creating supportive environments, reorienting nutrition service and no involvement in developing healthy public policy. Dietitians reported using nutrition evidence to support the content as compared with the process of care, and indicated

discussion with colleagues, and review articles as top sources of evidence. Emerging from this research was the importance of leadership and infrastructure in influencing nutrition evidence implementation.

The findings emphasize the importance of including both individual and organisational factors in the strategic planning for evidence-based practice. Plans need to be long-term and consider that change is a slow process. Leadership commitment is essential and there are clear benefits in developing a learning and professional supportive environment and considering contextual influences on the implementation of research in practice.

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APPENDIX 1. INFORMED CONSENT AND ETHICS REVIEW FOR DIETITIAN STUDY

UNIVERSITY OF ALBERTA

INFORMATION LETTER

Research Project: Heart Health Promotion in Practice: An exploration of Dietitians' Experiences and Perceptions

Investigators: Corilee Watters, Research Associate, University of Alberta
Dr. Kim Raine, Associate Professor, University of Alberta

This study explores dietitians' experiences and perceptions about implementing heart health promotion in practice. If you are currently working in the area of cardiology, or community, you are eligible for our study.

You will be asked to participate in a focus group with other dietitians to discuss your perspective on heart health promotion. The focus group session is approximately 2 hours in length and will be conducted by a trained facilitator. The sessions will be tape recorded and later transcribed. All responses and note taking will be coded to ensure confidentiality except when professional codes of ethics or legislation requires reporting. After the focus groups are over, you will be sent a questionnaire to complete that will take about 20 minutes to complete. Overall time commitment is expected to be a total of approximately 3 hours

The success of this study will depend on people feeling free to speak about their experiences and perceptions. Before the focus group and interviews start, you will be reminded that what is said will remain private. If there is something you would not like to talk about, there will be no pressure to share it. You have the right to refuse to answer any of the questions asked. Also, you have the freedom to withdraw at any point of the study. We will respect the privacy of all participants. No names will appear on the typed record of these groups and all our research will be based only on group results.

There are no risks to participating in this study, as it is intended to determine the best method for sharing information with health professionals. Results will be available to interested participants upon its completion. Data will be stored in a secure place accessible by only the research team for a period of 5 years. If in the future secondary analysis is to be done with these data, further ethics approval will be obtained.

If you would like more information please contact any of the investigators:
Dr. Kim Raine, Phone: 780-492-9415 Corilee Watters: Phone: 780-492-6504
If you have any concerns about how the study is conducted, please contact Dr. Francis Yeh, Associate Dean of Research at phone 492-9053.

Participants Initials : _____ Investigator's Initials:

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UNIVERSITY OF ALBERTA

INFORMED CONSENT

Title of Project: Heart Health Promotion in Practice: An exploration of dietitians' experiences and perceptions.

Part 1: Research Information		
Name of Principal Investigator: **Corilee Watters** Affiliation: **Research Associate, University of Alberta** Contact Information: **492-6504**		
Name of Co-Investigator/Supervisor: **Dr. Kim Raine** Affiliation: **Associate Professor, University of Alberta** Contact Information: **492-9415**		
Part 2: Consent		
	Yes	**No**
Do you understand that you have been asked to be in a research study?		
Have you read and received a copy of the attached information sheet?		
Do you understand the benefits and risks involved in taking part in this research study?		
Have you had an opportunity to ask questions and discuss the study?		
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your position.		
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records/information?		
Part 3: Signatures		
This study was explained to me by: CORILEE WATTERS Date:		
I agree to take part in this study. Signature of Research Participant:		
Printed Name:		
Witness (if available): Printed Name: : SANDY LOY		
I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate. Researcher: Printed Name: : CORILEE WATTERS		
* A copy of this consent form must be given to the participant.		

Department of Agricultural, Food and Nutritional Science
Faculty of Agriculture, Forestry, and Home Economics

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Health Research Ethics Board

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UNIVERSITY OF ALBERTA HEALTH SCIENCES FACULTIES,
CAPITAL HEALTH AUTHORITY, AND CARITAS HEALTH GROUP

HEALTH RESEARCH ETHICS APPROVAL

Date:	May 2002
Name of Applicant:	Dr. Corilee Watters
Organization:	University of Alberta
Department:	Agriculture, Food and Nutritional Science
Name of Co-applicant:	Dr. Kim Raine
Organization:	University of Alberta
Department:	Agriculture, Food and Nutritional Science
Project Title:	Heart Health Promotion in Practice: An Exploration of Dietician's Experiences and Perceptions

The Health Research Ethics Board (HREB) has reviewed the protocol for this project and found it to be acceptable within the limitations of human experimentation. The HREB has also reviewed and approved the subject information letter and consent form.

The deliberations of the HREB included all elements described in Section 50 of the *Health Information Act*, and found the study to be in compliance with all the applicable requirements of the Act.

The approval for the study as presented is valid for one year. It may be extended following completion of the yearly report form. Any proposed changes to the study must be submitted to the Health Research Ethics Board for approval. Written notification must be sent to the HREB when the project is complete or terminated.

Dr. Sharon Warren
Chair of the Health Research Ethics Board (B: Health Research)

File number: B-030302-AFNS

University of Alberta

Capital Health

CARITAS HEALTH GROUP

Capital Health

Regional Research Administration
Clinical Trials Centre
1800 College Plaza
8215 - 112 Street
Edmonton, AB T6G 2C8
Phone (780) 407-1372

NOTICE OF ADMINISTRATIVE APPROVAL FOR PROPOSED RESEARCH

Site: **CHA Region**

Project Title: Heart Health Promotion in Practice: An Exploration of Dieticians' Experiences and Perceptions

Project Number: W-1117

Investigator Name: Watters, Corilee

Department: Agricultural, Food & Nutritional Science/Medicine

Division:

Supporting Documents

Ethics Appoval Date: 03-May-02 **Ethics File #:** B-030302-AFNS

Study Protocol

Sponsor:

CRO:

Type of Funds:

Overhead rate: 0%

Legacy Account: U of A Account **Oracle Account:**

Contract Finalized Date:

Revised:

Project Approved: 12-Jul-02 **Comment:** Ethics approval received on July 10, 2002

Helene Donahue
Regional Research Administration
Copies to: Finance and Administartion

July 12, 2002

Health Research Ethics Board

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July 9, 2004

Our file #B-030302

Dr. Corilee Watters
Centre for Health Promotion Studies
5-10 University Extension Centre

Dear Dr. Watters:

Re: Heart Health Promotion in practice: An exploration of dieticians' experiences and perceptions

This is a very belated acknowledgement of your e-mail dated April 13 explaining the proposed amendment to the above study, which was originally approved in March 2002. Enclosed with your e-mail was a copy of the questionnaire you will use in the on-line survey.

Dr. Griener has reviewed your request and approved it on behalf of the Research Ethics Board. An updated approval form is enclosed for your records.

Next year, a few weeks prior to the expiration of your approval, a Progress Report will be sent to you for completion. If there have been no major changes in the protocol, your approval will be renewed for another year. All protocols may be subject to re-evaluation after three years.

For studies where investigators must obtain informed consent, signed copies of the consent form must be retained, and be available on request. They should be kept for the duration of the project and for a full calendar year following its completion.

Approval by the Health Research Ethics Board does not encompass authorization to access the patients, staff or resources of Capital Health or other local health care institutions for the purposes of research. Enquiries regarding Capital Health administrative approval, and operational approval for areas impacted by research, should be directed to the Capital Health Regional Research Administration office, #1800 College Plaza, phone 407-1372.

Yours sincerely,

Judith R. Abbott (Ms.)
Administrative Coordinator
Health Research Ethics Board

/ja
encs.

Health Research Ethics Board

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ETHICS APPROVAL FORM

Date: **June 2004**

Name(s) of Principal Investigator(s): **Ms. Corilee Watters**

Department: **Centre for Health Promotion Studies**

Title: **Heart Health Promotion in Practice: An exploration of dietician's experiences and perceptions**

The Health Research Ethics Board has reviewed the protocol involved in this project which has been found to be acceptable within the limitations of human experimentation. The REB has also reviewed and approved the subject information material.

Specific Comments: This project is an extension of a study originally approved in May 2002. The original project is completed but is being expanded to include an on-line survey of dietitians in health regions outside Capital Region.

JUL - 9 2004

Glenn G. Griener, PhD
Chairman, Health Research Ethics Board
(B: Health Panel)

Date of approval release

This approval is valid for one year

Issue: #B-030302

UNIVERSITY OF ALBERTA

Capital Health

CARITAS HEALTH GROUP

APPENDIX 2. HEART HEALTH QUESTIONNAIRE FOR DIETITIANS

1. The following lists factors and conditions that contribute to heart disease. Please indicate your current level of knowledge as it relates to dietetic practice and heart disease.

	1 No level of knowledge	2 A little	3 Some level of knowledge	4 Moderate level of knowledge	5 A lot of level of knowledge
High blood pressure	1	2	3	4	5
HIGH BLOOD CHOLESTEROL	1	2	3	4	5
Obesity	1	2	3	4	5
Genetic factors (family history)	1	2	3	4	5
Smoking	1	2	3	4	5
Poor diet	1	2	3	4	5
Physical inactivity	1	2	3	4	5
Lack of social support	1	2	3	4	5
Stress	1	2	3	4	5
Low Self-esteem	1	2	3	4	5
Low socio-economic status (education, occupation, income)	1	2	3	4	5
Poverty	1	2	3	4	5
Poor Work conditions	1	2	3	4	5
Discrimination (sexism, ageism, racism)	1	2	3	4	5
Large gaps in income (between wealthy & poor in a population)	1	2	3	4	5

2. The following lists factors and conditions that contribute to heart disease. Please indicate your current level of belief that they should be addressed in dietetic practice for heart disease.

	1 Strongly Disagree – should not be addressed	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree – should be addressed
High blood pressure	1	2	3	4	5
HIGH BLOOD CHOLESTEROL	1	2	3	4	5
Obesity	1	2	3	4	5
Genetic factors (family history)	1	2	3	4	5
Smoking	1	2	3	4	5
Poor diet	1	2	3	4	5
Physical inactivity	1	2	3	4	5
Lack of social support	1	2	3	4	5
Stress	1	2	3	4	5
Low Self-esteem	1	2	3	4	5
Low socio-economic status (education, occupation, income)	1	2	3	4	5
Poverty	1	2	3	4	5
Poor Work conditions	1	2	3	4	5
Discrimination (sexism, ageism, racism)	1	2	3	4	5
Large gaps in income (between wealthy & poor in a population)	1	2	3	4	5

3. For each of the following risk factors, rate your confidence in addressing in practice.

	1 Not at all confident	2	3 Moderately confident	4	5 Extremely confident
High blood pressure	1	2	3	4	5
HIGH BLOOD CHOLESTEROL	1	2	3	4	5
Obesity	1	2	3	4	5
Genetic factors (family history)	1	2	3	4	5
Smoking	1	2	3	4	5
Poor diet	1	2	3	4	5
Physical inactivity	1	2	3	4	5
Lack of social support	1	2	3	4	5
Stress	1	2	3	4	5
Low Self-esteem	1	2	3	4	5
Low socio-economic status (education, occupation, income)	1	2	3	4	5
Poverty	1	2	3	4	5
Poor Work conditions	1	2	3	4	5
Discrimination (sexism, ageism, racism)	1	2	3	4	5
Large gaps in income (between wealthy & poor in a population)	1	2	3	4	5

4. For each of the following risk factors, rate your frequency in addressing in your practice.

	1 Never addressed	2 Seldom addressed	3 Occasionally addressed	4 Often addressed	5 Always addressed
High blood pressure	1	2	3	4	5
HIGH BLOOD CHOLESTEROL	1	2	3	4	5
Obesity	1	2	3	4	5
Genetic factors (family history)	1	2	3	4	5
Smoking	1	2	3	4	5
Poor diet	1	2	3	4	5
Physical inactivity	1	2	3	4	5
Lack of social support	1	2	3	4	5
Stress	1	2	3	4	5
Low Self-esteem	1	2	3	4	5
Low socio-economic status (education, occupation, income)	1	2	3	4	5
Poverty	1	2	3	4	5
Poor Work conditions	1	2	3	4	5
Discrimination (sexism, ageism, racism)	1	2	3	4	5
Large gaps in income (between wealthy & poor in a population)	1	2	3	4	5

5. On average, how long do you spend with a patient on the initial visit ? _____ minutes

6. On average, how long do you spend with a patient on follow-up visits? _____ minutes

7. What is the average length of time patients at LOW risk for cardiovascular disease try diet and lifestyle interventions before medication is started?

a) < 3 months
b) 3 months
c) 6 months
d) 9 months
e) > 9 months

8. What is the average length of time patients at MODERATE risk for cardiovascular disease try diet and lifestyle interventions before medication is started?

a) < 3 months
b) 3 months
c) 6 months
d) 9 months
e) > 9 months

9. What is the average length of time patients at HIGH risk for cardiovascular disease try diet and lifestyle interventions before medication is started?

a) < 3 months
b) 3 months
c) 6 months
d) 9 months
e) > 9 months

10. In your practice, how often are the following conducted?	never	seldom	Occasionally	Often	Regularly
Weigh patients	1	2	3	4	5
Calculate their BMI	1	2	3	4	5
Measure Waist Circumference	1	2	3	4	5
Conduct Diet History (e.g. 24 hour recall, 3 day food record)	1	2	3	4	5
Calculate Coronary Heart Disease Risk	1	2	3	4	5

11. Please rate your frequency of use of the following sources of information?	never	seldom	Occasionally	Often	Regularly
Discussion with dietitian colleagues	1	2	3	4	5
Communication with specialists (e.g. Cardiologists)	1	2	3	4	5
Textbooks and manuals					
Benchmarking with other programs					
Internet and web- based information (e.g. Google)	1	2	3	4	5
Original research articles (clinical trials)	1	2	3	4	5
Review articles	1	2	3	4	5
Canadian Recommendations for management and treatment of dyslipidemia (CMAJ, 2003)	1	2	3	4	5
US National Cholesterol Education Program ATP III Therapeutic Lifestyle Change (2002)	1	2	3	4	5
American Heart Association's population based guidelines at the community level (2003)					
Manual of Clinical Dietetics (American Dietetic Association and Dietitians of Canada) 2000					

12. The following section relates to the Recommendations for management and treatment of dyslipidemiaand prevention of cardiovascular disease (Jenest, CMAJ, 2003). Are you aware of this guideline? (If no, scroll down to Question 21)

a) yes
b) no

13.How did you first learn about the guidelines

a) direct mail of document
b) read published article in medical journal
c) discussion with colleagues
d) presentation at rounds or conferences
e) press release/population press (eg. newspaper)
f) on-line resource (eg. cardiosource, The heart.org)
g) Other, please specify.

14. In regards to the guideline, please indicate your agreement with following:	1 Strongly Disagree 2 Disagree 3Neutral 4 Agree 5 Strongly Agree
a) The guideline is important	1 2 3 4 5 N/A
b) The guideline is clear	1 2 3 4 5 N/A
c) The guideline is relevant	1 2 3 4 5 N/A
d) The guideline is simple to understand	1 2 3 4 5 N/A
e) The guideline is reliable	1 2 3 4 5 N/A
f) The guideline is credible	1 2 3 4 5 N/A
g) The evidence regarding the impact of guidelines on practice is available	1 2 3 4 5 N/A
h) The guideline makes current practice more effective	1 2 3 4 5 N/A

15. Did you change your practice as a result of the guideline?

a) yes
b) no

16. The guideline has enabled me to implement the following. Indicate your agreement	1 Strongly Disagree 2 Disagree 3Neutral 4 Agree 5 Strongly Agree
a) Acquire additional information	1 2 3 4 5 N/A
b) Use guideline on a regular basis	1 2 3 4 5 N/A
c) Revise education resource materials	1 2 3 4 5 N/A
d) Change counseling practice	1 2 3 4 5 N/A
e) Change work practices	1 2 3 4 5 N/A
f) Promote the guideline to others	1 2 3 4 5 N/A
g) Change policies and procedures	1 2 3 4 5 N/A

17. Factors that have helped me put the guideline in practice are as follows. Indicate your agreement.	1 Strongly Disagree 2 Disagree 3Neutral 4 Agree 5 Strongly Agree
a) Education sessions (rounds, conferences)	1 2 3 4 5 N/A
b) Awareness of importance	1 2 3 4 5 N/A
c) High priority	1 2 3 4 5 N/A
d) Clinical lead or local champion	1 2 3 4 5 N/A
e) High level of evidence	1 2 3 4 5 N/A
f) Low cost	1 2 3 4 5 N/A
g) Patient education materials	1 2 3 4 5 N/A
h) Consulting with specialists	1 2 3 4 5 N/A
i) Office reminder systems	1 2 3 4 5 N/A
j) Community resources (eg. grocery store tours, collective kitchens)	1 2 3 4 5 N/A
k) Policy/procedure, administrative changes	1 2 3 4 5 N/A
l) Being involved in research	1 2 3 4 5 N/A

18. My experience with the guideline has indicated the following. Please indicate your agreement.	1 Strongly Disagree 2 Disagree 3Neutral 4 Agree 5 Strongly Agree
a) Assessing patients is more systematic	1 2 3 4 5 N/A
b) Managing patients is more efficient	1 2 3 4 5 N/A
c) Follow-up is more structured	1 2 3 4 5 N/A
d) Patient education is more effective	1 2 3 4 5 N/A

19. If you have not fully implemented the guideline, indicate the reasons:	1 Strongly Disagree 2 Disagree 3Neutral 4 Agree 5 Strongly Agree
no advantage to change current practice	1 2 3 4 5 N/A
clinical judgement is superior to use of guidelines	1 2 3 4 5 N/A
lack knowledge	1 2 3 4 5 N/A
lack training in counseling skills	1 2 3 4 5 N/A
forget due to high workload	1 2 3 4 5 N/A
not a priority area for me	1 2 3 4 5 N/A
Information is too complex	1 2 3 4 5 N/A
guidelines are too general, not specific enough	1 2 3 4 5 N/A
lack time to implement	1 2 3 4 5 N/A
Policies in my organization prevent changes	1 2 3 4 5 N/A
require more resources for implementation	1 2 3 4 5 N/A
Inadequate education materials	1 2 3 4 5 N/A
lack of patient compliance	1 2 3 4 5 N/A
not relevant to my patients/program	1 2 3 4 5 N/A
Colleagues disagree with recommendations	1 2 3 4 5 N/A
Lack authority or autonomy to make a change	1 2 3 4 5 N/A
Other guidelines take precedence	1 2 3 4 5 N/A
Guidelines are outdated	1 2 3 4 5 N/A
Guidelines do not include rating of evidence	1 2 3 4 5 N/A
Lack dietitians for patient referral	1 2 3 4 5 N/A
Lack of supportive environments (eg. healthy choices available in workplaces, and community)	1 2 3 4 5 N/A

20. What strategies would you suggest to overcome these barriers?

21. Other comments about using research or guidelines in your practice?

22. What is your practice area?

a) Cardiology/Lipids
b) General Out-patients (ambulatory care)
c) Diabetes
d) Community
e) Administration
f) Other, please specify

23. What is your type of practice?

a) primary (community and out-patients)
b) secondary (rehabilitation)
c) tertiary (acute care, in-patients)
d) regional mandate (all of the above)
e) other, please specify

24. What is your location of practice?

a) 1- Chinook Regional Health authority
b) 2- Palliser health region
c) 3 Calgary health region
d) 4- David Thompson regional health authority
e) 5 -East central health region
f) 6 -Capital Health
g) 7 Aspen regional health authority
h) 8 Peace country health
i) 9 Northern lights health region

25. On average, how many patients for cardiovascular disease risk modification do you see per week? ____ (# patients)

26 . How long have you been in practice? _____ (years)

27. What is your education level?

a) Bachelors
b) Masters
c) Other, please specify

28. What is your BMI?

29. Are you a smoker? Yes No

30. Physical activity or exercise includes such activities as brisk walking, cycling, jogging, swimming or any other activity where the exertion is similar to these activities. Your heart rate and breathing should increase.

How many days per week are you physically active? _____ (days)

How many minutes do you participate in physical activity on each of those days? ____ (minutes)

31. A typical serving of vegetables and fruit includes: 1 cup raw vegetables (eg. carrot and celery sticks), 1/2 cup cooked vegetables, 1/2 cup juice, 1 medium fruit (apple, banana, orange etc),

How many servings of vegetables and fruit did you have yesterday? _____ (servings/day)

APPENDIX 3. VALIDATION QUESTIONNAIRE

Thanks again for participation in the focus groups. As you know, we asked dietitians working at the provider and management level in the area of cardiovascular disease risk modification to tell us about their experiences using research and guidelines in practice.

We reviewed the transcribed tape recordings from the focus groups and then analyzed them for common themes. Before I compile the report for this project, it is important to know whether the themes we chose fit with your (or dietitians that work for you) experience. Please place an **X** in the appropriate box.

Member Checking Results (n=13)

Item	Percent Agreement
Health promotion means focusing on the individual	76 %
-offer suggestions for decreasing barriers for individual change	92 %
- healthy lifestyle approach (diet, activity, smoking)	100 %
- providing education (information/resources) with consistent messages	100 %
- setting realistic goals based on stages of change	69 %
- individual 'empowerment' (for self-directed promotion of heart health)	85 %
personal responsibility for health	92 %
Average for individual focus	88%
Health promotion means a population focus	100 %
- target vulnerable groups	92 %
- having community resources (e.g. grocery shopping tours)	100 %
- using media and internet for advocacy	100 %
-Policy and environmental change	100 %
Average for population focus	98 %
Overall average	**92 %**

Themes – research use	Percent Agreement
Research is used to support content (e.g.omega-3 fats, fibre, DASH diet) **of intervention**	100 %
Research is used in context of patient factors (co-morbidities, medical progress)	100 %
Research is used in combination with values to make decisions	100 %
There can disagreement on interpretation of research/ evidence among dietitians	92 %
Research is used to develop patient education materials	100 %
Research is <u>less</u> used to support process (e.g. number of visits, length of visit) **of intervention**	69 %
Research is less used to support process of intervention due to . . .	
- lack of time	76 %
- lack of autonomy (e.g. patients follow-up visits determined by clinic protocol)	76 %
-lack of research (e.g. little research on actual impact a dietitian teaching about nutrition has on that person's risk for heart disease)	92 %
In absence of research, benchmarking (comparison with other programs/services) is used.	85 %
In absence of research, extrapolation (from specific populations/ages) is used.	76 %

Themes – research use (cont'd)	**Percent Agreement**
Research is less used when preparing for a new job than other information sources (textbooks, diet manuals, talking with colleagues)	76 %
Research is used less for unusual patients/ novel therapies than other information sources (internet, talking with colleagues or patients themselves)	69 %
Research is used to conduct research	72 %

The following factors can facilitate guideline use	**Percent Agreement**
education sessions (rounds, seminars)	100 %
awareness of importance	100 %
Clinical leader (eg. Cardiologist) support	100 %
Clinical team support (eg. referrals from other team members)	100 %
Patient education materials	100 %
Program structure (setting, frequency of visits etc)	100 %
Inpatient menu consistent with guidelines	76 %
Community resources (e.g. grocery store tours, collective kitchens)	85 %
Audit and feedback (e.g. progress reports)	100 %
Other (please indicate)	

The following factors can be barriers to guideline use	**Percent Agreement**
limited follow-up with clients (due to short length of stay, and clients from outside of region)	100 %
lack time	100 %
Difficult to change current practice	100 %
Lab tests only have primary prevention guidelines for normal reference values	69 %
medications used as primary treatment more than diet	76 %
Guideline is too general, not specific enough for nutrition	85 %
Lack of patient compliance	69 %
Colleagues disagree with recommendations	76 %
Lack training in counseling skills	76 %
Lack of dietitians in primary care	69 %
Lack of supportive environments (e.g. healthy choices in workplaces and community)	85 %
Other (please indicate)	

To what extent do you agree the following strategies can improve guideline use?	Percent Agreement
education sessions	100 %
multidisciplinary intervention	100 %
need for physician education	100 %
dietitians to be involved in guidelines	100 %
more specific guidelines are needed to track outcomes	100 %
consistent practice guidelines in the region	100 %
increase availability of dietitians	92 %
increase public and MDs awareness of nutrition importance through advocacy and media	100 %
government support (*need dietitian/ nutritionist lead at the provincial level)*	92 %
professional support (*continuing education sessions and patient education materials)*	100 %
partnerships (*linkage with other professional organizations in addition to Dietitians of Canada)*	100 %
guidelines for guidelines	69 %

APPENDIX 4. ALBERTA HEART HEALTH PROJECT SURVEY QUESTIONS FOR THE NUTRITION IN RHA STUDY

Name _____

Code_____

Year 2

THE ALBERTA HEART HEALTH PROJECT

The purpose of this survey is to detail practices, capacity, facilitating factors and barriers to health promotion at an **organizational level**. We suggest that you complete this survey on your own time in preparation for the group session. A similar version of the survey will be completed by respondents like you over the next 3 years.

Participation is voluntary. As noted in the information letter, confidentiality is assured and only aggregate statistics will be reported. Your name is necessary for tracking purposes and will be replace with a code immediately upon receipt. Results will not identify any respondents by name.

If this is the first time you complete the survey please make sure you have read the information letter and completed the consent form.

Instructions for completing the survey

The survey will take approximately one to two hours to complete.

There are no right or wrong answers to the questions in this survey, as we are seeking your impressions and perspectives. Please try to complete the entire survey. Good approximations are better than leaving the items blank. If there are any questions or sections that you feel do not apply to you please let us know by writing NA (not applicable) beside the question or section.

Unless otherwise specified, the "we" and "our" in the questions refers to the organization you work for. Organization is defined as the whole organization and not only your division, department, etc.

If you wish to make a comment on the questions, or clarify your answer, please do. We will use your comments to guide our research.

Once you have completed the survey and consent form (if you are a new respondent) please place them in the envelope provided, and return it to the site coordinator by June 30, 2001. We will be collecting the surveys from them.

Should you have any questions regarding this survey or the AHHP, please do not hesitate to contact: *Donna Anderson*, Research Coordinator at (780) 492-6504 or donna.anderson@ualberta.ca

THANK YOU ♥

B: HEART HEATH KNOWLEDGE AND PARTICIPATION

The next three questions ask about your organization's heart health knowledge and its orientation towards health promotion.

1. The following table lists factors and conditions that contribute to heart disease.

→ Please indicate your estimation of your <u>organization's current level of knowledge</u> for each factor as it relates to heart disease.

	Lowest level of knowledge				Highest level of knowledge
Physiological Factors					
a) High blood pressure	1	2	3	4	5
b) High blood cholesterol	1	2	3	4	5
c) Obesity	1	2	3	4	5
d) Genetic factors (family history)	1	2	3	4	5
Behavioral Factors					
a) Smoking	1	2	3	4	5
b) Poor diet	1	2	3	4	5
c) Physical inactivity	1	2	3	4	5
Psychosocial Risk Factors					
a) Lack of social support	1	2	3	4	5
b) Stress	1	2	3	4	5
c) Low self-esteem	1	2	3	4	5
d) Low socio-economic status (exclusion, marginalization, deprived)	1	2	3	4	5
Environmental Risk Conditions					
a) Poverty	1	2	3	4	5
b) Poor work conditions	1	2	3	4	5
c) Discrimination *(sexism, ageism, racism, etc.)*	1	2	3	4	5
d) Large gaps in health between the wealthiest and the poorest within a community, region or province	1	2	3	4	5

6

3. Organizations serve populations with different needs and concerns. Considering the structure of your organization and the needs or concerns the population your organization serves.

→ *In column one*, please indicate <u>how strongly you believe</u> your organization should address each of the following factors.

→ *In column two*, please indicate <u>how capable you would say your organization is</u> in addressing each of these determinants of health.

→ *In column three*, please indicate <u>your organization's level of involvement</u> with each of these factors during the past twelve months.

	Column 1					Column 2					Column 3				
Physiological Factors															
a) High blood pressure	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) High blood cholesterol	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) Obesity	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d) Genetic factors	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Behavioral Factors															
a) Smoking	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) Poor diet	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) Physical inactivity	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Psychosocial Risk Factors															
a) Lack of social support	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) Stress	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) Low self-esteem	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) Low socio-economic status *(education, occupation, income)*	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Environmental Risk Conditions															
a) Poverty	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) Poor work conditions	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) Discrimination (racism, sexism, ageism)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d) Large gaps in income between the wealthiest and the poorest within a community, region, or province	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

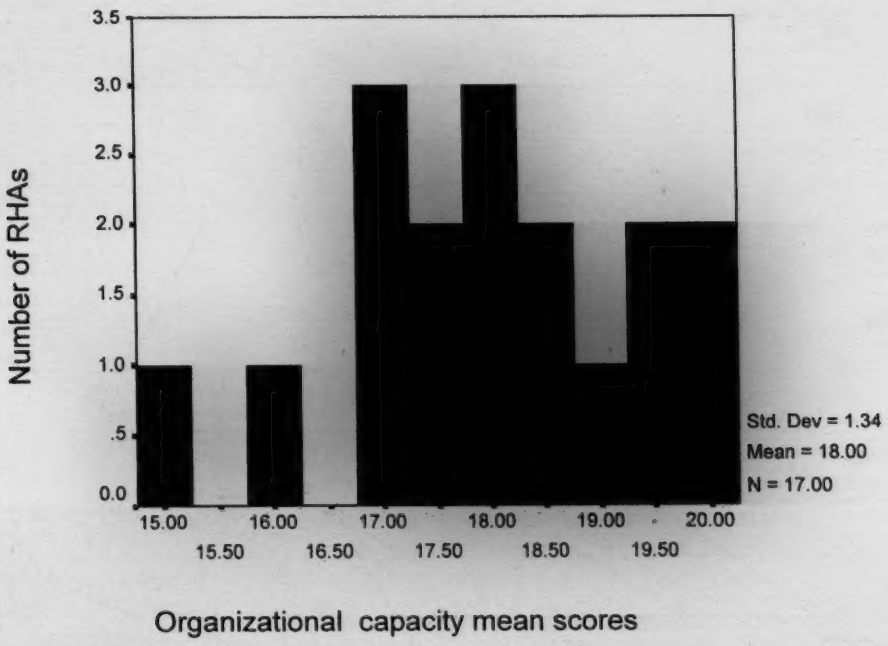
4. The following four questions relate to participation in various activities, and refer to participation alone or in partnership with others. As before, for each statement, please rate your organization in three different ways.

→ *In column one,* indicate your organization's level of ability to conduct these activities.

→ *In column two,* indicate your organization's level of involvement in these activities during the past twelve months.

→ *In column three,* please rate the desired level of involvement over the next two years for each activity. (*By desired, we mean the level of involvement you would be satisfied with for your organization*).

	Column 1 Our level of ability to conduct these activities					Column 2 Our level of involvement in these activities during the past twelve months					Column 3 Our desired level of involvement over the next two years				
1. Participate in tobacco reduction related activities															
a) in schools	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) in workplaces	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) in health care settings	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d) in the community at large	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Other sites:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2. Participate in nutrition related activities															
a) in restaurants	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) in grocery stores	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) in schools	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d) in workplaces	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
e) in health care settings	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
f) in the community at large	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Other sites:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3. Participate in physical activity related activities															
a) in schools	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b) in workplaces	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c) in health care settings	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d) in the community at large	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Other sites:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
_____	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4. Participate in other heart health activities															
Please list															
a)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5



Appendix 5. RHA categorization into high, medium, and low organizational capacity

A histogram (figure 1) displaying the frequency distribution of mean organizational capacity scores (will (belief + desire + prior action) & infrastructure & leadership) (n=17) for each RHA was examined to determine cut off points for high, medium and low capacity. It was decided that low capacity RHAs include those with mean scores that fall below 17, medium capacity RHAs fall between 17 and 18.9, and high capacity RHAs include those with mean scores above 19. (Note: The highest possible score for organizational capacity is 25). Number of RHA represented on the y (vertical) axes and mean RHA score on the x axes.

APPENDIX 6. Health Promotion Action Means

Health Promotion Action Means **High Capacity Region**	**Innovation process in Regional Health Authorities**		
	Initiation Phase Agenda Setting, Matching	**Decision**	**Implementation** Clarifying, Routinizing
Develop Personal Skills	We have always said, 'You facilitate population health throughout the organization.' So, it's everyone's responsibility. …what I would hope in the future would be to see, ' physicians, saying to their patients who come in for a common cold, how is your nutritional intake? (interview) they've got a website that's got wonderful research-based efficacy in so far as treatment regimes and I know that I could walk upstairs right now and still see people practicing in old ways in that field and probably every other field. I know in nutrition that there's lots of room for improvement, in our nutrition counseling (interview)	in this region we have a 20% higher incidence of MIs, cardiac incidents in younger males . .. and we have done a literature review ourselves and we are addressing physical inactivity because that is said to be one of the risk factors that you get a real trickle down effect from. When people are physically active they tend to smoke less and watch their diet more (interview)	we use the radio to do, as well as the newspaper…every week we have an article on health promotion or something that's usually relevant to, you know, the month or the season or something. We …collaborate with other agencies on some of their promotion issues. …the next thing will be healthy recipes …there's going to be a cook-off.
Reorient Health Services		We've discussed it philosophically at the committee and at the board level that there will be direction that this will be a health promotion, education, and prevention-driven organization	I think regionalization has enhanced our ability to do health promotion just because with regionalization, we integrated our services. We integrated the community and all our health services into one center, one organization, one administration. And I think the philosophy of management has been from that time, to weave

			health promotion through all aspects of our service delivery. And I think that was good because it brings the awareness to everyone. Like instead of like the 25 or 30 people we had working community before being on voice for health promotion, now we have 700 people.
Strengthen Community Action			1995 when we received the designation of World Health Organization Safe and Healthy Community. We were the first community in North America and we were very proud of that and what has spun out of that is a meeting of the minds of industry and school and small business and health. The post secondary school here, and many of the NGOs meet on a monthly basis with what they call the X Safe Healthy Community Network and so that's a time where, monthly, they talk about injury prevention, health promotion, education and community initiatives, networking to meet the same goal – to meet the goal of improving the wellness of the people of our region. (interview) have a CEO aboard and an upper management who really want to work with partners. We never see ourselves isolated here (interview)

			Oh, there are so many partners. You know, when you just list who we're affiliated with, depending on what area of the health centre…Community health council members sit on all of our quality improvement teams. there's no problem doing health promotion because …we have so many partnerships and we get the funding we need from the community
Create Supportive Environments	I'm not sure that with the budget we have and with the way things are being done that you're going to get anywhere with exercise, diet. You're up against McDonald's and Burger King, and whoever else, and you're not going to get anywhere handing out Canada's Food Guide	cardiac is a strong focus in [our city]…in the needs assessment we identified it as an area that needs to improve. So we have lots of community health, council members, people from the workforces that are interested	
Build Healthy Public Policy	I think that the Council of Chairs and the Council of CEOs, as the leaders of the regional health authorities, could be more influential in the swaying or actually changing public policy. interview)		our vice-chair, actually took on a leading role in this community to affect the smoking bylaw here and we did see effective change.

Health Promotion Action Means Medium Capacity Region	**Innovation process in Regional Health Authorities**		
	Initiation Phase Agenda Setting, Matching	**Decision**	**Implementation** Clarifying, Routinizing
Develop Personal Skills	need one-on-one, more direct programs for people so they have the tools to know or to assist them to change habits. Like a lot of, as far as health promotion, smoking, overeating, making the wrong choices maybe with eating and not exercising. That's like life-long learned bad habits and to try to change them. They really do need…messages help but they…a lot of people need their hands to be held, to get them out there walking…to start them off.		We have some beautiful aboriginal healthy eating and resources… they're going to be disseminated to the aboriginal coordinator position through Health Canada. I think the harder part was taking that message back to our regional health authority and convincing them that these were good things and they should regularize these funds. it was provincial proposal dollars and national proposal dollars directed toward aboriginal programs that kept us coming back until…it's been now regularized into the Health Region budget Like our Hugs program. It's a 10-week weight control program. We went through the media, through communications here –to advertise the program, sent out messages on Medi-tech to the dietitians and diabetes lipid education – to people that might have clients who could benefit from the program. our dietitians, they get nutrition news.

			. and if its something that interests us, then they forward that …and then we post it on our bulletin boards. And we've got a heart health resource center so we'll put things up in there, you know, for the general public to read. We did a workshop, we've done several in the last year. Part of this was related to our poverty initiative, but it has a broad application. We did a community development workshop where we invited staff from other departments, and quite a few did participate. We did a social marketing workshop where again, several of the departments participated No one put in my job description that I've got to train a new board every three years.
Reorient Health Services	if you're one out of twenty people in the room, and the only one arguing for health promotion, you don't carry an organization. far as money raising goes like the Hospital Foundation a lot of it goes more to the hospital right into programs and it's not so much put	When I say the organization, the board has adopted the determinants of health framework as they endorse that concept. But at the next level, the senior management are struggling with that concept because most of them come out of an acute care and they keep saying there's no evidence	NAPPY friendship project …we have both clinical nurses, clinical dietitians but that also serve a health promotion role. instead of more traditionally we would have those positions go out as full clinical positions we've split those positions so that they're half

	into health promotion.		health promotion specialists and half clinicians
Strengthen Community Action	In terms of physical activity and nutrition I think we're still…people are becoming more interested and becoming more keen but I think we're just kind of at that tip of the iceberg. We're just starting to get the awareness out there and people are realizing…So, I think we still have a long way to go. We had good statistics on poverty rates throughout the region. We decided to do a pilot project in two communities. We approached one community and they were they were certainly in denial that no, we don't have a poverty problem, where are these people, we decided not to proceed with that community because we just didn't feel they were ready to address the issue	We're working on a project with the food bank. An inter-faith food bank and we've been meeting with their board members and people from here have been meeting with them to do a community-kitchen for people living in poverty, I have a meeting . ..with their fundraiser guy. We'll talk about different ways to get money and then we'll talk about the grant writing.	overall, as an organization, we partner a lot. I would say it's pretty key in all of the processes that we do to work within the community and the education institutions. partnership with the Indian Tribe, Department of Health and to form a Diabetes Heart Health education program out there we've got that direction from the region and then the direction also to form community partnerships because again when you think of all the resources – community pharmacies, Be Fit for Life, all the different community resources we have, we really don't have to do it ourselves.
Create Supportive Environments	But we are looking . . . at obesity as a major issue and we're going to be having an obesity initiative We need to take some responsibility .. . a café that serves healthy snacks. meals. Physical activity is one that we	Like they used to have heart health fairs, I remember, and you just don't see that as much. I know they did the restaurant Heart Smart .	So they've gone into schools and looked at . . . some of the feeding issues and some of the poverty and the food security type things the 5-10 a day…to have the logo there and being able to use that. We did use that for some grocery store displays

	haven't done extremely well. In part because its not clear who is in charge, there are other players here. Recreation is seen as one of those nice to have, but not necessary to have. And municipal levels, other structures have sort of sunk. We've got to start asking ourselves what is our role there. I also don't think its appropriate for the health sector to be the leader in every one of these areas. You can question whether we should or shouldn't be involved in workplace wellness, okay, or whether its Alberta Labor.		and mall displays, restaurant displays. It was already in place. We didn't have to design it, which was nice.
Build Healthy Public Policy	found you can take health promoting activities to a certain extent, but you can only take it so far until you get either neighborhood buy in or provincial buy in. Tobacco being the best of the examples, where we found we'd taken tobacco reduction, tobacco cessation, tobacco policy as far as we can within the region, until such time as there's a strong, a willingness to do it at a provincial level They're [The board are] told is all that they have to do is balance the budget. It's the only thing they have to do. They're not told that they have to improve people's health.		

Health Promotion Action Means Low Capacity Region	**Innovation process in Regional Health Authorities**		
	Initiation Phase Agenda Setting, Matching	**Decision**	**Implementation** Clarifying, Routinizing
Develop Personal Skills	vision is that a health center is a very active part of the community and … they perceive it as a support for them in the community, in their lifestyle choices. …if you're going have your nutrition kitchens, where are they happening? They're happening at your health center. say public health needs to have the manpower and the time to do teaching. Like in the schools, the children are in desperate need to learn about nutrition because they're losing a battle, they're all becoming type two diabetics, which means again they're not eating right, they're not exercising right. There's a knowledge gap there, there's a real problem. And when you look at tobacco reduction she's a smoker herself (focus group, 2002) a highly immune population doesn't do you any good if they're all falling apart at the seams … they're feeding their kids all the wrong things		Action for Health is another area that we work with. And that, that is very health promotion focused. We funded a program in Delia, we gave them some money to get started. And it's the Delia Active Living I think they call it. And they're, with the funds that they've received, they're bringing, they started by bringing somebody out to help them get into, they started like an exercise club.

Reorient Health Services	we're being funded on a per capita basis, the healthier your population is, the more money you have available politics of health, health is seen as in hospitals, and hospitals are seen as economic development for small towns need to downsize our acute, and long-term care, we're heavily over-bedded ineffective acute care beds in small towns rather than primary health settings, as multi-discipline teams. it is comfortable to focus on the so-called lifestyle factors because they're politically safe. It is not comfortable to focus on environmental factors, .. because they are politically risky, okay. And you are dealing with one of the most conservative areas in Alberta like many other organizations, has gone through many restructurings..., focused entirely on acute care services rather than on promotion we are trying to get away from disease of the month. We are trying to look at determinants of health, okay. since they did the strategic planning. We've had the opportunity to go to	position of health promotion. And then also put cardiac rehab, diabetes and nutrition, under that because we basically, we wanted to move those into more wellness focused versus, you know, an illness model, rehab model.	

	the board and talk to them about health promotion		
Strengthen Community Action	Like its not that we don't have a lot of partners, . . everybody is very busy. You know, they have a plateful just to try and keep their own organization functioning. The ability to really sit down and partner, that, I mean there you have to blend visions, you have to blend philosophies, you may have to sometimes blend funding, …Those aren't like a one off meeting and you go and meet for an hour and decide okay, you do this, I do that, you do that, you know. You're kind of stepping in each other's turf, or maybe some old traditional turfs, that type of thing. there's a great deal to be done in health promotion in the community we don't have those designated people that can get out and do the work, you know, even if you start with your organized groups, like your Kiwanis, like your Chamber of Commerce people, your business people,…. It takes manpower to get out and be with the public and start working towards building that capacity Today we had the town council	[had a Hutterite Heart Health project and this was huge, and the whole gist of that was to reduce obviously, heart disease amongst the Hutterite population. And this was quite big and it involved a nutritionist and, um, you know, learning how they did things. Not to change the foods they eat, because you're not going to change the foods they eat, but maybe cut down on a little bit of fat, and instead of frying this, maybe bake it, things like that. blood, like labs and everything. . . And it wasn't funded after two years, which was a huge disappointment. . . bigger organizations have people whose sole job it is to write funding proposals	like with collective kitchens, I mean yeah, we were partnered with, you know, social services and . . . other organizations in the community that were involved with that. And that I think is always a really good thing because they have a completely different perspective, they have a completely different way of approaching things than what you do.

	invited in and we had lunch with them and we talked about a couple issues that we had in common.		
Create Supportive Environments	But one board member said well, we can't go over and tell them what not to do, you know, like vending machines in schools and things like that. its doing some things like getting the candy and pop machines out of our schools because they see that as a way to raise money to pay for basic, basic things maybe it's going to talk to the people who are in the grocery stores and saying you know I know you're wonderful community people and you donate a lot. Can we talk about how maybe instead of the sugar donuts you could give them a break on a fruit tray. You know it's changing their thinking about it.		
Build Healthy Public Policy	successful example[of], health promotion might include community members. Ah, we actually had this happen so it was very exciting, coming forward and saying we want to get a, a smoking by-law passed, and can you help us?		

APPENDIX 7. ANALYSIS OF RHA BUSINESS PLANS AND ANNUAL REPORTS

Coding Assumptions:
Will: Vision, Mission, business plan (intentions)
Leadership: Champions : MOH listing on Executive; Community Health Councils
Infrastructure: (staff, resources, partnerships with municipality, industry & community): % promotion/ prevention services of total budget, # of partnerships

A. Health Promotion, Chronic Disease Prevention, Determinants of Health,

Health Region	Will	Leadership	Infrastructure
1. **Chinook Health Region (CHR)**	**Vision**: best of health for everyone **Mission**: promote, protect, and improve the health & well-being of everyone in the CHR Core Business 2: includes "encourage and promote healthy living"	MOH, has leadership position as VP on the Board Two Community Health Councils (Seniors Health and Mental Health)	**001-2002 3.81%**-of budget for Promotion, Prevention and Protection Services. Partnerships: operated diabetes program in partnership with NAPI-Friendship Primary focus to support and encourage the wellness and health of its citizens. Chronic disease clinics for diabetes, congestive heart failure, hypertension and arthritis will provide consistent advise, reduce duplication of tests and multiple appointments and increase access to latest clinical practice guidelines
2. **Palliser (PHR)**	**Vision** Healthy People in a Healthy Region **Mission** Working together to promote, maintain, improve and protect health and wellness by providing health services that are responsive, accessible and accountable. Core business 2 includes "encourage and promote healthy living". PHR Guiding Principles "put people's health and wellness first ---" " provide a holistic evidence-based model of health which may include various complementary and traditional healing practices, health promotion and education. b. Target to complete another health assessment of the region's residents similar to the 1999 "Working Together for Health" and develop strategies for action.	Three Community Health Councils mandate to support community efforts toward health by providing information and resources related to health and health promotion through the distribution of information kits & pamphlets.	**2001–2002 3.8%** of budget for Promotion, Prevention and Protection Services Partnerships a. Tobacco Reduction Coalition b. Active Transportation Committee c. Health Connections d. Learn e. Food Connections f Eating Disorders Committee g. Child Youth Health Network focuses on improving the health of children and youth.
3. **Headwaters (HHR)**	**Vision** Healthy People, Healthy Places, Healthy Headwaters **Mission** Headwaters Health Authority works with individuals and communities to promote, protect, maintain and restore their well-being. core businesses # 2 "A primary focus of the health system is to support and encourage the wellness and	Six Community Health Councils a. Headwaters Healthy Authority	**2001- 2002 5%** of budget for Promotion, Prevention % Protection Services. Goal #2 To improve the health and well-being of Albertans through health authority strategies for protection, promotion and prevention 1999 Health status Report Card Summary suggested that a chronic disease management approach should be developed and implemented.

	health of Albertans, not just to diagnose and treat the ill and injured. Health promotion and protection programs, disease and injury prevention programs ---"		
4. Calgary (CHR)	**Vision** Our community working together for excellence in health. **Mission** The Calgary Health region is committed to excellence in providing an accessible, accountable and integrated, community-based health system which promotes shared responsibility for improved health.	One Community Health Council(s) - "the Region 4 Aboriginal Community Health Council and is not planning on establishing any additional. The Council provides input to the Region for development of an Aboriginal Injury Prevention Program; planning of a Aboriginal Health Centre; Youth health issues ; develop partnerships to promote awareness and develop programs for holistic health	**2002** year end March 31,02 **2.5%** of budget for Promotion, Prevention and Protection Services Programs that focus on Wellness and Health Promotion and Disease prevention will be enhanced by March 2003. Objective to Provide a healthy work environment. Availability of a fitness/Wellness programs will be extended to regional staff outside of dayshift hours by March 2003. Partners in Health: U of Calgary, Calgary Health Trust and Alberta Children's Hospital Foundation
5. Regional Health Authority 5 (HA5)	**Vision** A society of healthy individuals and communities. **Mission** To work together with our community to provide services and information that will promote, protect, improve and maintain the health of the population in an accessible, responsive and affordable manner. Core Business #2 "Encourage and promote Healthy Living". HA5 is expanding its activities in the area of health promotion advocating for health, and healthy public policy. Goal # 2 To improve the health and well-being of Albertans through strategies for protection, promotion and prevention- focus in areas of injury prevention, smoking, diabetes, heart disease and suicide.	Community Health Councils (None) HA5 continues to use alternative formats to formal community health councils as a means to engage with individuals, groups and communities. HA5 is in early stages of turning data into information to identify a number of areas i.e. Health status issues, specifically diabetes and hypertension. - MOH available on a consultant basis	**2001 4.5%** of budget for Promotion, Prevention and Protection Services Partnerships with: Carbon, Acme and Linden communities for a Primary Health Clinic; Seniors Outreach Program based in Three Hills; Aboriginal Liaison worker; Didsbury physician Manpower Committee; Alzheimer Group; Rosebud Foundation; Hanna Task Group.
6. David Thompson (DTHR)	**Vision** Healthy people living in healthy communities. **Mission** The David Thompson Health Region will endeavor to provide consumer responsive health services that are appropriate, affordable, accessible, accountable and promote healthy living. Core Business #2 "Encourage and promote healthy living".	One Community Health Council assists in identification of health issues, collect information and advise the DTHR on specific issues as assigned by the DTHR Authority ---does not have any operational responsibility. 5 communities are currently participants in the Healthy Communities Initiative. The Healthy Promoting Schools Initiative has increased from 8 to 12 this year The Regions staff are able to access "The Employee Assistance	**2002 3.2%** of budget for Promotion, Prevention and Protection Services Updated *Health Report* (population health assessment)is being developed in 2002. Partnership with : HAPI (Healthy Aging Partnership Initiatives). Diamond Willow Child& Family Services Authority which focuses on the development of child health indicators for the Region's *Health Report* Committee for Healthier communities committed to provide a forum for collaboration of community-based activities.

		Program" to help them to develop strategies for healthy living.	
7. EastCentral (ECHR)	**Vision** Healthy People in a Healthy Environment **Mission** East Central Health provides services which: a. Promote the development of safe, healthy environments in partnerships with communities. b. Are accessible, appropriate and based on needs. c. Promote health, wellness and improve quality of life. d. Achieve public satisfaction with the health system in the Region. Core Businesses #2 Encourage and promote healthy living. Goals #2 To improve the health and well-being of Albertans through health authority strategies for protection, promotion and prevention	Three Community Health Councils to serve as information centers for the residents of the region. and provide information and feedback to the Region. a. A plan is in place for health promotion strategies. b. A comprehensive chronic disease management plan is developed and implemented across services.	**2002 3.0%** of budget for Promotion, Prevention and Protection Services East Central believes that individuals have a responsibility for their own wellness, health and safety. . Partnership: with the Alberta Medical Association to implement the Diabetes Guidelines throughout physician offices. With Vermilion & District Housing Authority for supportive housing HAPI..
8. WestView (WVHR)	**Vision** Health and wellness for our communities. **Mission** To promote, maintain and improve the health and wellness of residents in the WestView Region by ensuring the availability of appropriate, accessible and affordable health services.	a. Six Community Health Councils: working collaboratively on implementing Injury Prevention Strategy for the Region. Some of the CHC's attended the "Partnering to Promote Community Health . Health Promotion Programs and Services offered in all the communities (6) within the Region.	**2002 7.27&** of budget for Promotion. Partnerships with various community organizations and the Region staff Prevention and Protection Services. A committee assisted the Regional Health Promotion and Program Assistant to administer promotion initiatives in the communities across the region. Developed a proposal to expand the Region's Healthy Families to our aboriginal families and to young mothers/families. Partnership with Health Canada regarding Aboriginal Health issues (Diabetes Education Program).
9. Crossroads (CRHR)	**Vision** healthy people living in healthy communities **Mission** promote a healthy community and deliver health services that meet the needs of the Region	One Community Health Council Identified Key Health risks for Region and First Nation communities in the Region: heart disease, diabetes, cancer, injury, alcohol and substance abuse, chronic lung disease and suicide.	**2001-2002 5.14%** of budget for Promotion, Prevention and Protection Services Partnerships with U of A, U of C and community fitness agencies to Develop/deliver a Diabetes Education Program with a community operated Physical Activity component
10. Capital	**Vision** Healthier people in healthier communities. **Mission** To improve the health and well-being of our community through cooperation with our partners - the community, providers, educators and researchers. We will create and maintain an integrated, accessible and affordable health system with excellence as our constant goal. a. Initiated a public health information computer based kiosks in Region's hospitals and North East Community Health Centre to enable people to access information on health, medical science, lifestyles, disease symptoms and risk behaviors..	Seven Community Health Councils actively consult with the region's communities to provide the Board with local consumer feedback on important health issues. (Healthy Aging and healthy Weight in Children) a. Capital Health invites key community and medical leaders to serve on the Board as non-voting members (VP of Medical affairs; Pres. Medical Staff; Dean of Medicine; Pres. and CEO of the Region; and the Mayors). b. Continue to provide	**2001-2002 4%** of budget for Promotion, Prevention and Protection Services. Partnerships: University of Alberta, Grant McEwan College, NAIT, SAIT and NorQuest College 8 Foundations which provide support and finance of many projects. a. Of 5 Core Activities for Capital Health are for Promotion of Health and Prevention through provision of Health information. b. 2001/2001 Capital health increased emphasis on promoting wellness and preventing illness and injury. January 2002 report "*How Healthy are We*?" special initiatives were designed to reduce smoking, prevent injuries, reduce heart attacks & strokes, promote healthy eating, encourage regular physical exercise and support healthy aging.

		leadership in public health policy to support health promotion and injury prevention. c. Develop detailed plans to address priority areas of injury prevention, heart disease/stroke, nutrition and health issues in an aging population.	
11. Aspen	**Vision** Aspen Regional Health Authority is a client-centered health care system that encourages compassion, dignity and respect for each individual within our organizational efficiencies. **Mission** To provide health care services to the residents of the Aspen Region. The Region actively promotes and encourages residents to make wiser choices regarding disease and injury prevention and take responsibility for their own health, wellness and quality of life.	Four Community Health Councils act as a forum for public input and liaison with the Region of health issues and needs within each area. a. Population Health/ Workplace Health attempting to setup wellness program for employees. b. The Senior Friendly Toolkit a program to help make your community more "senior friendly". c. Healthy Families Initiative was developed to address the gap between the needs that families with young children have and the Early Intervention Program.	**2001-2002 4.7%** of budget for Promotion, Prevention and Protection Services. Partnership: Alberta Cancer Board; Aspen Student Health Initiative Partnership (ASHIP);Continue to develop partnerships with First Nations, Alberta Mental Health Board, Persons with Development Disabilities ; Child and Family Services and school Divisions. Disseminate findings from projects funded by Action for Health Community Grants. . Will continue to develop key messages to the public/staff to promote awareness about lifestyle choices, wellness and prevention of illness and injury.
12. Lakeland	**Vision** Healthier people in a healthier Lakeland Region. **Mission To** promote health, prevent injury and disease, heal illness and treat injury to improve the well-being of all people.	Five Community Health Councils. Provide a forum for the discussion of community health priorities, the identification of cultural and economic barriers to health; potential developing health issues. - MOH is available as a consultant	
13. Mistahia	**Vision.** Partners in Healthy communities. **Mission** The Region is committed to: Building healthy communities; Promoting responsible lifestyles and Delivering quality health care. The Region sees their primary role to promote and protect the health of the population and work to protect those within its boundaries.	Six Community Health Councils Healthy lifestyles is a focus of health reform and is considered a priority by the region's Board and Community Health Councils. Aboriginal Health Liaison Worker was hired in community health.	**2001-2002 4%** of budget for Promotion, Prevention and Protection Services. 2002-2003 write and implement a health promotion plan that is linked to the Strategic Service Plan. Continue to incorporate health promotion in all aspects of service delivery 2002-2005 Partnerships: Grande Prairie and Area Safe Communities; Aboriginal Health Liaison Partnership; Capital Health for Health Link;
14. Peace	**Vision** Healthy, responsible and accountable Albertans in the Peace Health Region. **Mission** The Peace Regional Health Authority will promote healthy environments and lifestyles and provide services to produce healthy citizens in the region within available resources. Note: A population that is less	Two Community Health Councils in the region but having difficulty getting these up and run to obtain community input.	**2001-2002 7 %** of budget for Promotion, Prevention and Protection. Partnership with the HAPI program; Building Better Babies funded by Canada Prenatal Nutrition Program, Families First a home visitation program. Implement strategy for needs assessed in region's 2001 Peace Adolescent Total Health (PATH) assessment report Aboriginal Health initiative, "The House

	healthy than the provincial average. Goal #2 To Improve the health and well being of Albertans through strategies for protection, prevention and promotion. Recognition of the need to increase funding for Community Health Promotion and Prevention activities but inability to do so. .		By the Bridge", to increase aboriginal access to community health, nutrition and cardiac services
15. Keeweetinok Lakes	**Vision** People of Keeweetinok Lakes Health Region live as healthy a life as possible in environments conducive to good health and well-being. **Mission** Individuals, families and communities take responsibility for their health, well-being and illness episodes. Individuals and families achieve the best possible level of personal and family health that circumstances allow. Quality health and health care services are planned and provided, through people-focused, integrated networks and partnerships, in a manner, which is appropriate, affordable and accessible.	Two Community Health Councils 2 are active and the Board is resolved to establish an Aboriginal Health Council. Develop strategies for caring out a 2nd health needs assessment	**2002 7.5%** of budget for Promotion. Prevention and Protection Services. Health promotion leads many of the Region's injury prevention activities through direct contact with the students in the schools and community events and local media. Partnerships Neegan Awa'asak Children and Family Services; Lesser Slave Lake Indian Regional Council ADDAC and regional schools etc..
16. Northern Lights	**Vision** Creating a healthier future by each of us making a difference today. **Mission** To promote health and provide responsive, accessible, quality service, in cooperation with the people of the region. (Core Business 2).. It is well known that knowledge or early intervention can make a major difference on modified health risks Health Promotion and protection programs, Disease and injury prevention programs and education programs are actively pursued in partnerships with the communities, service providers	One Community Health Council been inexistence for five years. Accomplishments this year: hosting radio spots to promote health promotion and prevention education topics as well a spot to broadcast the role and work of the Council; members of working groups related to regional Needs Assessment; sponsored ads and promotion activities related to health determinant issues; funded babysitting education programs for safe care of children. One of the Council's goal is to actively provide information to educate and influence individuals thus empowering them to choose healthy lifestyles.	**2001 –2002 5.5%** of budget for Promotion, Prevention and Protection Services. Utilizing a determinant of health approach the region will continue to actively pursue ways to influence, reward, promote education the population of the region in order to encourage and promote healthy living. Advocate for health and healthy public policy. Partner with Wood Buffalo Student Health Partnership; Canadian Diabetes Association educator; Residents continue to make lifestyle choices that may put their health at risk and preventative health practices of residents could improve.
17. Northwestern	**Vision** Improving Health, promoting Wellness. **Mission** The Northwestern Health Services region through community consultation and partnerships, will develop, within available resources, an integrated health system focused on achieving a " healthy population".	Five Community Health Councils with key priorities/strategic planning for each community.	**2001-2002 7.4%** of budget for Promotion, Prevention and Protection Services. Update health and promotion plans Address high priority health issues, including low birth weight babies, Aboriginal health issues, disabilities in the region. Monitor trends and respond to emerging health needs of protection, prevention and promotion Partner with HAPI All seniors lodges

	Business Plan Core #2: "Encourage and promote healthy living". Goal # 2 To improve the health and well-being of Albertans through health authority strategies for protection, promotion and prevention.		have "Aging in Place" programs.

B. Heart Health, Diabetes

Health Region		Examples
1.Chinook	a. CHR have a Diabetes and Lipids Education Centre. There is a program operating in the physician clinic in Taber. b. A Hypertension clinic is also in the early stage of development c. The Congestive Heart Failure Clinic received project funding for 6 months. A project proposal is under development to secure longer term funding and enable future development of the clinic as part of the new collaborative Chronic Disease Model. This model, would see programs such as the Diabetes and Lipid Education, Cardiac Rehab, Stroke, Population Health, Transition Team and Clinical Nutrition share resources in provision of information and services to this clientele.	d. CHR developed a physician and client tool to assist with the implementation of the Diabetes Clinical Practice Guidelines. The AMA is now funding a study to examine the impact of this tool on clinical practice. e. The Aboriginal Health Program successfully operated a diabetes program in partnership with the Napi Friendship Centre in Pincher Creek. f. A partnership was developed with the Sik-Ooh-Kotoki Friendship Centre to deliver diabetes prevention and health promotion initiatives
2.Palliser	not identified in any programs However, Goal 2 :To improve the health and well-being of Albertans through health authority strategies for protection, promotion and prevention stated " that these services include major strategies aimed at TB, STDs and HIV, as well as injury and selected Chronic diseases---"	
3.Headwaters	Goal # 2 To improve the health and well-being of Albertans through health authority strategies ----Strategy # 5 2002-2004 Collaborate with partners in the implementation of injury and suicide, cancer and heart disease prevention initiatives Create regional Injury, Cancer and Heart Disease Prevention Plans that provide frameworks for meeting community needs and ensure regional/community balance..	1999 Health Status Report Card Summary: 42% of Vulcan/Carmangay respondents reported high cholesterol. Only 13% of the Headwaters Health Region's respondents were aware that they had high blood pressure. and more than a third of these were over 65. .
4.Calgary	Heart Health Program--- stated that "we are adding years to life by providing highly specialized programs and services to prevent and treat cardiovascular diseases".	Diabetes Education Centre and a Hypertension & Cholesterol Clinic at the Peter Lougheed Centre
5.Regional Health Authority 5	HA5 have determined that Diabetes education is a priority for the region. Additional Diabetic educators have been added to expand the diabetic education program(offered 22 one day classes) and allow for self-referral to the program. The medical staff are reviewing the AMA clinical practice guidelines. Siksika Nation diabetic teaching staff work closely with the HA5 staff. .	The Region will continue to participate in the Alberta Heart Health project. HA5 is reviewing its practices with respect to the Diagnosis and treatment of hypertension. Cardiac rehab. program in Drumheller and Didsbury which uses the Canadian Guidelines for Cardiac Rehabilitation and Cardiac Disease Prevention. Public awareness about heart health is one focus .Future plans to expand services in Didsbury and include a wellness component on risk factors associated with cardiovascular disease.
6.David Thompson	Strategy 2.6 "Promote and support chronic disease prevention. The Healthy Aging Plan, which addresses chronic disease prevention was submitted to Alberta Health and Wellness as part of the Continuing Care Plan. Establish a operational plan and performance indicators for this program by March 2003.	No further mention of heart or diabetes programs in the report or business plan.
7.East Central	Established Regional Cardiac Rehabilitation Program for Region. operational in Wainwright, Acute Care Programs. Nothing identified in heart health promotion activity. A strategy to improve the management of chronic disease by greater integration between professionals, programs and physicians with the outcome for 2001-2000 "Provide	Partner with Alberta Medical Association to implement the Diabetic Guidelines throughout physician offices. b. Diabetes Support Group supported by the Community Health Council areas: to determine the needs of Diabetics in the

	opportunity for meetings/consultations to address the Determinates of Health and encourage communities to participate in healthy lifestyles".	Region. Tofield, Provost & Consort established a Diabetes clinic/multi-disciplinary program.
8.Westview	2002/2003 Programs and Services in communities in the Region:: a. Cardiac Wellness in five out of six. b. Diabetes Education in five out of six.	
9.Crossroads	a. Heart Health Program focused on Crossroads staff for 2001-2002, information and screening for cholesterol and blood sugar level b. Public Health and Community Services goals strategy 3.1 page 65 Continue to broaden work in areas of Community Wellness, Heart Health, Tobacco addiction Awareness, Injury Control, Mini Heart Works events held at schools, grades 7, 8 & 10 (interactive lifestyle stations focused on blood pressure, healthy eating/healthy weight, clean air, active living and inner health) c. Strategy 3.6 To enhance nutritional resources available to children, parents and caregivers through increased resources and integration with Crossroads chronic disease prevention nutrition programs, Alberta Cancer Board and other community initiatives that will lessen the risk for development of colorectal cancer and other chronic diseases (cardiovascular and diabetes).	d. Seniors Wellness Conference, 2001 included the presentation of the topic, "Heart disease and Stroke – Healthy Seniors Lifestyles", "Seeing Into the Future" e. Women's Health Fair March & April 2002 had speakers from Canadian Heart and Stroke foundation, Registered Dietitians of Canada and University of Alberta" Be Fit for Life" "Women and Heart Disease How We are Different", "Healthy Lifestyles". f. The Employee Wellness Program was launched in January 2002 with significant focus on strategies that will improve wellness and decrease the risk for many chronic diseases; i.e. cancer among them. Community Nutrition Program taking the lead. g. Partner with the grocery stores – public store tours and a "Shelf-Takers" program that encourages healthy choices. h. A school focused project --- SCHEP (School. Community and Family Health Education Programs)
10.Capital	a. Worked with the U of A in supporting research initiatives including the Heart and Stroke Research Centre and the ongoing development of the "Edmonton Protocol for Islet transplantation". b. Chronic diseases, including cancer, cardiovascular disease, diabetes, respiratory and arthritis are now the major causes of illness, disability and death in the region. c. Regional Diabetes Service Delivery Model is being developed and implemented. d. The Aboriginal Diabetes Wellness program offers education and treatment services to Metis, Inuit and First Nations peoples.	e. Supported the Alberta Heart Health project & .development of the Alberta Heart Institute f. Participated in the SLICK project(screening for limb, eye, cardiovascular and kidney complications of diabetes. The program involves 2 vans equipped with advanced information and communication technologies to all 44 Alberta First Nations communities for the purpose of implementing the Canadian Diabetes Ass. Clinical practice Guidelines
11.Aspen	Through support of Health Innovation Funds from Alberta Health and Wellness, a regional diabetes education program was developed based upon the standards for Diabetes Management. b. Evaluate a social marketing campaign promoting behaviors to prevent heart disease, cancer and/or diabetes 2002-2003.	a. Region completed a 2-part survey that looked at the Region's capacity to perform Heart Health Promotion. b. Heart Health Fair 2002 Whitecourt an attempt to increase awareness amongst staff and community (successful)
12.Lakeland		
13.Mistahia	2002-2005 implement a regional Diabetes program	Nothing identified in Heart health promotion/prevention.
14.Peace	a. Chronic Disease initiative Action for Health , Diabetic/Cardiac program for 2004. b. Ongoing Diabetes education and cardiac/rehabilitation program provided by Cardiac/Rehab/Diabetes educators. c. Regional Participation in DOVE Study (Type II Diabetes).	Collaboration with Peace River Aboriginal Health Initiative, "The House By the Bridge" to increase access to community health, nutrition and Cardiac services.
15.Keeweetinok Lakes	a. Diabetes is increasing in the region (Type 2 diabetes) and the age of people testing positive are younger than expected. the DOVE Study group was in the region 3 days each month from July to Dec. 2001. Seen mostly those with major complications of diabetes. Established a Regional Diabetes Working Committee to create awareness of the impact of this chronic illness, to	b. Explore childhood obesity as a problem i.e. diabetes and cardiac problems. c. Health Promotion leads the way of the region's injury prevention activities with direct contact through the students of the schools where topics include heart

	standardize and coordinate diabetic educational activities and provide continuing education for the members. The region counsels individuals with type 2 diabetes at all major sites. this is done by Clinical Nutrition Services. The Regional Diabetes Coordinator held 65 clinics increase awareness for diabetes education, prevention, treatment and follow-up. Development of various diabetes initiatives that were tailored to fit within the culture and context of the Region (S.E.A.R.C.H.)	health
16.Northern Lights	a. Canadian Diabetes Association educator visit outlying area to make presentation to staff and students in schools. b. Physicians continue to refer aboriginal patients to the Capital Region's aboriginal diabetes education program c. Implementation of the Canadian Diabetic Association teaching guide,. 2002-2003. Investigate telehealth delivery of aboriginal diabetic education 2002-2003.	d. In line with the Region's Goal 2 to support and promote well-being and quality of life, protect health and well-being and prevent disease and injury the Region will annually up-date Action for Health Plan and implement chosen initiatives. Address high priority Health issues such as Cardiac and addictions. e. continue to participate in the Alberta Healthy Heart Project. 2002-2004
17.Northwestern	Develop a diabetes prevention program 2002-2005	

C. Diet, Poor Diet, Food, Obesity

Health Region		Examples
1.Chinook	The Southern Alberta Poverty Coalition continues its work to increase awareness about those living in poverty and success in increasing the number of nutritional feeding programs offered in schools. a. Community Kitchen Program delivered by the community nutrition staff to several communities throughout the region, 1800 participants learned to prepare meals and snacks that are nutritious and economical. b. Staff developed the "First Nations Healthy Choice" recipe book that was approved by the Canadian Diabetes Association. c. The Mother Infant Support Committee comprised from Wellness Services, women and Children's Health, Peigan Health Centre and Blood Tribe Health Services continue to monitor and address issues related to promotion of optimal birth outcomes and prenatal health (reduction of modifiable risk factors such as smoking and prevention strategies such as healthy eating choices). d. CHR supports the Mazankowski Report and areas of focus for improving population health are: provide information and programs about healthy eating, healthy lifestyles and active living and reduction of inequities among population groups.	e. Dieticians are assigned a group of patients and are involved with the care of the client whether they are inpatient or outpatient. The patient groupings established include: Risk Reduction Surgical and Nutrition Support Assessment, Surgical and Mental Health, Homecare and Medical, Outpatient and Better Beginnings and Maternal Child. f. Health Promotion plans for the CHR include initiatives for Healthy Eating/ Active Living g. The regional Clinical Dietitians will provide information and services to persons experiencing a variety of chronic problems under the Chronic Disease Model which is in progress for the CHR. a Healthy Lifestyles Class calendar was developed for Sept. 2002. this calendar outlines classes on numerous healthy lifestyle topics presently provided within individual program areas. h. Service development of the Eating Disorders Program will continue presently operates in Regions 1 & 3.
2.Palliser	a. Community Nutrition promoted healthy eating in schools by working in partnership with school personnel and community members. snack programs and information related to healthy food choices was provided. b. Health Connections which includes Food Security for Families, Best babies, Building blocks, Healthy Communities.. c .Brooks Food bank Foundation offers emergency food to the impoverished, educates them on how to secure and prepare. Brooks Breakfast for Learning and Community School Nutrition Coalition promotes the importance of Breakfast to school aged children.	d .Food Connections (Standing Committee of Health Connections Association) work to reduce food insecurity within the Central Area through education, collaboration, advocacy, skill development and promoting increased access to affordable food. Components include Community Kitchens, Good Food Box Club, Nutrition and Food Workshops, Food Hot Line and Youth in the City to name a few. e. Eating Disorders Committee to

		promote communication, awareness throughout the region and how these can be effectively prevented and treated.
3.Headwaters	1999 Headwaters Health status Report Card Summary a. 70% of residents reported consuming less than 5 servings of vegetables per day. b. Close to half of the males and females between the ages of 20 and 64 were within their acceptable BMI range. Vulcan/Carmangay had the highest proportion of overweight individuals(38%).	Eating Disorders Program operates in Regions 1 and 3 as part of the Alberta Mental Health Board provincial Eating Disorders Program
4.Calgary	a. Low birth weight babies (the highest in the country) was identified as an indicator of overall population health. Factors contributing are: maternal age over 35; Smoking during pregnancy and specific Tobacco reduction initiatives and being targeted toward pregnant mothers and a 3 year "Community Prenatal Care Study" was implemented. b. b.Introduced Alberta-wide education modules to promote healthy views and behaviors toward body image and self-acceptance among children and adolescents	Nutrition Help Line received 2,318 queries. Introduced "Barbie's Body Far From Normal" to grade 5 class to help them to develop healthy attitudes and behaviors toward their own growing bodies. Calgary Eating Disorder Clinic was opened to treat people aged 14 – 25 with severe and complex eating disorders.
5.Regional Health Authority 5	Optimizing child development Community Nutrition (collective kitchens) initiatives	Mental health body image program
6.David Thompson (DTHR)	Strategy 2.8 "Promote and support healthy nutrition and eating" a. implementation of the Alberta Cancer Board program " Simply Healthy" which address the need to increase consumption of fruits and vegetables. b. Healthy Infant feeding practices	The DTHR and the Kevin Sirois Fitness Centre in Red Deer College provided a course on "Lifestyles which focused on healthy eating and physical fitness.
7.East Central	a. Nutrition Week supported by the Community Health Councils in their area of the Region i.e. Vermilion.	Public Health and Nutritionists to partner with schools and other agencies to develop an integrate a Regional Nutrition Program to increase public awareness of nutrition and fitness by 2002. School strategy 2002/2003 Health Promotion plan is contingent on reallocating Community Grants moneys to this initiative.
8.Westview	Workplace Wellness Successful initiatives: "Strive for Five" five –10 servings of fruits and vegetables.	
9.Crossroads	a. Community Nutrition Program, partner with public groceries, "Shelf-takers" encourages healthy choices. The Employee Wellness Program was launched in 2002 focus on improving wellness and decrease the risk for many chronic diseases –involves the collaboration of many regional programs with the Community Nutrition Program taking the lead. b. Mini Heart Works held at 3 schools focused on heart health and healthy eating/healthy weight and active living	c. A school focused project Community nutrition SCHEP (School, Community and Family Health Education Program). Develop/impact policy that will impact positive food choices in school cafeterias and vending food choices. d. Strategy 3.6 To enhance nutritional resources available to children, parents and caregivers through increased resources and integration with Crossroads chronic disease prevention nutrition programs, Alberta Cancer Board and other community initiatives. Increased resources for children and families will encourage lifestyle changes that will lessen risks for development of cancer, and other chronic diseases such as cardiovascular and diabetes.
10.Capital	a. The region is supporting currant initiatives in response to "Responding to the Childhood Obesity Epidemic" Two workshops were held (6th, Annual Nutrition and Food Service Conference. and 3rd, Annual Western Canada Nutrition Symposium).	f. Continue with health promotion partnerships and supporting the Health Curriculum in area schools. g. Parents and children would benefit from more information and better

	b. The Community Health Councils were encouraged to address the issue of healthy weight in children. They responded that a population approach i.e. influencing the broad determinants of health including healthy lifestyles is an effective way to address this serious problem. c. Enhance day programs and other services for those with eating disorders d. Develop detailed plans to address nutrition in the aging population and Low birth weight. babies. e. Better regulation and advertising of the nutritional value of food products is needed.	understanding of dietary and nutritional requirement. h. Capital Health should support the development of "social marketing campaigns" to address the exposure of children to unhealthy food choices and excess food portions. i. Provide feedback on nutrition supplements and special diets to Blue Cross resulting in change in coverage for patients following discharge from hospitals.
11.Aspen	Many Aspen programs deliver message of healthy eating and, active living	Low birth weight babies, young families , Canadian Prenatal Nutrition Program offered in 2 communities.
12.Lakeland		
13.Mistahia	a. Partnership in the Canadian Prenatal Nutrition Program a high priority health issue is low birth weight babies. Continue the Pregnant Teen Program b. Healthy Families Program to be expanded to allow more families to be enrolled.	Expand the Aboriginal Health Liaison program within the region
14.Peace	a. Collaboration with Peace River Aboriginal Health Initiative, "The House By the Bridge", to increase aboriginal access to community health, nutrition and cardiac services. b. Diabetes /Cardiac Education c. Building Better Babies to address issue of low birth-weight babies.	d. Nutrition programs targeting young families and children in collaboration with schools in the region.
15.Keeweetinok Lakes	Canadian Prenatal Nutrition Initiatives for low birth weight babies. in partnerships with the Metis Tri-Settlement Project, the Good Start Prenatal Project and Healthy Choices project these are support by the Region through community nutrition/dietician services. Clinical nutrition Services provides counseling for diabetes.	Community Kitchens projects, the target is to serve families --- give parents the skills to provide their children with nutritional food on a more regular basis increasing the likelihood of healthy children. They also get information on proper nutrition and budgeting . Explore childhood obesity as a problem i.e. diabetes and cardiac problems.
16.Northern Lights	a. The Student Health Initiative a cooperative with AWASAK Children's Services includes Nutritional therapy. A comprehensive Student Health service delivery manual for use by schools and professionals has been developed and circulated 2000-01.	b. Low birth weight Babies the Region continues to support the Canadian Prenatal Nutrition Program "Food for Two"
17.Northwestern	The region has Nutrition Counseling program There is a recognized need for a program for low birth-weight babies.	

D. Physical Activity, Exercise

Health Region		Examples
1.Chinook	a. Health Promotion Plans for CHR include initiatives for Healthy Eating/Active living b. Chronic Disease Model would free up more resources for clients in other areas for more education, and support around physical activity and more classes in rural areas. (pg. 41)	c. In support of the Mazankowski Report areas of focus for the CHR will include programs about healthy eating, healthy lifestyles and active living. pg 52
2.Palliser	a. Active Transportation committee formed to address decreasing levels of activity among young people and the negative affect on health and quality of life. The purpose to increase awareness of the importance of physical activity and to determine the barriers that exist to increasing activity. . The schools ,Medicine Hat City and College, Fitness Resource Centre, and Safe Community Coalition are	Students and employees are encouraged to walk, bike or rollerblade to school and work.

	participants on this committee.	
3.Headwaters	1999 Headwaters Health Status report Card Summary: only 38 % of the regions residents reported being active. Recognized that a sedentary lifestyle of the residents is a modifiable risk and need for a program aimed at individual and societal change.	Programs should be developed that target healthy childhood development strategies, in particular areas of focus should be physical activity and consumption of fruits and vegetables.
4.Calgary	Wellness program extended to regional staff beyond day shift.	Active living mentioned once in connection with a goal to health promotion.
5.Regional Health Authority 5	Collaborate with schools to advocate for increasing physical activity.	
6.David Thompson	1996 the DTHR rate of residents reported being physically inactive was 48% for males and 50% for females(provincial rate of 47% and 50% respectively).	The DTHR and the Kevin Sirois Fitness Centre at Red Deer College jointly provide a course on Lifestyles, which focuses on healthy eating and physical fitness. Discounts to various fitness facilities throughout the DTHR are offered to staff.
7.East Central	Public Health and Nutritionists to partner with schools and other agencies to develop and integrate a Regional Nutrition Program to increase public awareness of nutrition and fitness by 2002	School strategy 2002/2003 Health Promotion plan is contingent on reallocating Community Grants moneys to this initiative.
8.Westview	Nothing identified in the 2001/2002 annual report	
9.Crossroads	a. 5th Annual seniors Wellness Conference the region invited seniors groups to participate in the regional Summer Active Challenge.	
10.Capital	a. Some initiatives suggested by the Community Health Councils: Tax breaks to encourage parents to enroll their children in sport and fitness programs. b. Opportunities exit for the health sector to play a role in Urban design which would promote healthy lifestyles.	c. From "the How Healthy Are We" report specific initiatives were designed to promote healthy eating and encourage regular physical activity.
11.Aspen	Many Aspen programs are delivered which have messages of healthy eating and active living	Nurturing Our Wellness, a conference for seniors featured active living and self-care.
12.Lakeland		
13.Mistahia	Nothing identified in report or business plan.	
14.Peace	Nothing was identified in the report or business plan for 2002- 2005/	
15.Keeweetinok Lakes	A survey of the Region's residents stated that 48% of the population exercise at least 20 minutes 3 times a week.	
16.Northern Lights	a. Combine the resources of the Energy in Action and the Cardiac Education committees to develop a comprehensive community activity program 2002-2004 f. Combine the resources of the Energy in Action and the Cardiac Education committees to develop a comprehensive community activity program 2002-2004	Region staff program for fitness and wellness initiatives.
17.Northwestern	Nothing identified in the report or business plan.	

E. Smoking, Tobacco Cessation

Health Region		Examples
1.Chinook	Health Promotion Plans for CHR are for Tobacco Reduction The Population Health Program has a goal to reduce tobacco use in the Region by helping non-smokers stay smoke free, protecting children from the harmful effects of environmental tobacco smoke and educating mothers on the risks of tobacco use to unborn children. the main emphasis will be on preventing youth from starting to use	b. Maintenance and further empowerment of the Chinook Tobacco Resource Network especially in regard to increasing the number of smoke free places in the CHR. c. Implementation of the Better Beginnings "Kick Butt for Two"

	tobacco products. The upcoming year will focus on working with AADC to ensure past successes in the area of tobacco reduction are maintained as the responsibility for leadership in this shifts to AADAC .Strategies implemented are: a. Collaboration with the Health Canada Tobacco Control Act Enforcement Officer to decrease access to tobacco products by youth.	Smoking Cessation Program assisting pregnant women to stop smoking. d. Participation of school health nurses in health fairs and other events to draw attention to the harmful effects of tobacco products including chewing tobacco. e. Provision of funding for youth to attend provincial peer support/leadership training conferences.
2.Palliser	a. The Tobacco Reduction Coalition worked with the City of Medicine Hat and Brooks to increase awareness and support for legislation banning smoking in public places accessible to children. b The Region smoke free policy was revised to prohibit smoking in the front entrances of Palliser Health Region buildings Implemented the Palliser Health Region Workplace Wellness Program which included enrollment of staff in smoking cessation programs..	c. Smoke Free children, Families and Communities provided a coordinator to work with young children and their families on a variety of tobacco reducing initiatives for children, family members, caregivers and communities throughout the Region.
3.Headwaters	Strategy #1 Update health promotion plans and evaluate initiatives. (Tobacco Reduction plans) Strategy #3 Expand initiatives to reduce the use of tobacco products by Albertans with an emphasis on youth. (Implement targeted health promotion strategies geared to risk age groups based on identified community need).2002-2005 1999 Headwaters Health Status Report Card Summary: 25% of the population over 12 are smokers, smoking amongst youth continues to increase, smoking contributed to 22 % of the deaths and 25% of the population over the age of 12 reported being exposed to second hand smoke.	a. Banff-Lake :Louise continue partnership with Smoke Free Bow Valley to support bylaws that will see the banning of smoking in public places wherever children may be present. b. Claresholm and Area work toward a Smoke Free Initiative for Claresholm. Canmore is the only community with a no smoking bylaw for restaurants and Canmore, High River, Nanton and Vulcan are the only communities that have a no smoking policy or bylaw for places of public assembly. c. Lung cancer has become a leading cause of death among women – to reverse this trend, multi-faceted tobacco reduction strategies must be developed and implemented. Further development of non-smoking bylaws should be strongly pursued.
4.Calgary	Similar to elsewhere in Canada, the leading cause of preventable death in Calgary is tobacco use. About 25% of Calgarians smoke compared to the national average of 22%. the four leading causes of smoke-related deaths are heart disease, lung cancer, stroke and COPD. a. the Region introduced "the toxic tunnel" on Weedless Wednesday as a novel teaching tool to discourage kids from starting to smoke. b. Calgary Tobacco Reduction Action Coalition (**CTRAC**) are committed to reducing tobacco use by building consensus and mobilizing the community. CTRAC is working towards reduced tobacco use in communities;, the impact of second-hand smoke; committed to seeing a smoke-free bylaw in place; launched a website for smoke free Calgary and created multi-media campaigns.	c .A Specific Tobacco reduction initiative targeted toward pregnant mothers to reduce rate of low birth-weight babies. d. Initiatives aimed at reducing tobacco use will be enhanced. The Region's policy on tobacco reduction strategy implemented including policies for clients receiving care in their own homes and mental health inpatients. e. Involved in Provincial strategies for educational initiatives, support and advocacy for effective control measures.
5.Regional Health Authority 5	HA5 views tobacco reduction as a primary means to promoting and protecting health so will continue to enhance the tobacco reduction program by a. Continuing to focus on encouraging smoke-free home environments for children. b. Self-study program to assist pregnant women to stop smoking c. Develop and implement a HA5 smoking policy	d. Potentially offering smoking cessation classes. e. Aim to reduce youth tobacco use. Partnering with Federal and Provincial organizations to promote tobacco reduction in the region i.e. Health Canada, ASH and Alberta Lung Association " Clean Air Campaign".
6.David Thompson	Strategy 2.11 "Promote and support tobacco reduction". a. DTHR is assisting the City of Red Deer with planning for public education campaign to increase awareness of the New	c.447 business have registered with the Smoke Free Business Registry (368 in Red Deer)

	bylaw (banning smoking in places accessible to persons under the age of 18) that came into effect September 2002. b. smoking cessation information/resources has posted on the DTHR website and pamphlet has been distributed.	d. DTHR policy "Toward a Smoke Free Environment" has been reviewed. Tobacco use in the region are similar to Alberta average of 30% of total population over the age of 12 smoke.
7.East Central	Strategy 2.3 Expand initiatives to reduce the use of tobacco products with and emphasis on youth. a. Partner with the Alberta Tobacco Reduction Alliance to complete school tobacco surveys (completed). b. No communities with smoke-free bylaws. c. 8 tobacco reduction initiatives with schools. d. 9 community action groups addressing tobacco reduction.	e. 2 community coalitions have identified smoke–free spaces as a priority for the upcoming year. f. number of smoke-free restaurants has increased over the past year.(25) g. Community presentations to youth of the harmful effects of tobacco products.
8.Westview	a. One Community Health Council offered a Smoking Cessation program. b. Workplace Wellness offered stop smoking sessions Target group for the region is youth with emphasis on young females.	c. Strategy is to expand initiatives to reduce use of tobacco products by ''Albertans with emphasis on youth. d. Reviewing policy, prompting cessation programs for staff of the Region and the public e. Partnership with Alberta Tobacco Reduction Alliance (ATRA), Action on Smoking And Health (ASH) to implement tobacco reduction initiatives.
9.Crossroads	a. Health Promotion Programs — improve the health of our population included Tobacco Addiction Awareness Prevention Program. b. Strategy 3.4 Smoking and tobacco use focus on education in schools and communities, cessation support, healthy public policy —possible pilot of Bill 208 (2001-2004). c. Chronic Lung program to include 3 phases, smoking cessation, rehabilitation and follow-up d. "Off Your Butts" a group cessation program for teens which was successful. e. Dental Health Program provided 64 hours of tobacco education to 2,011 students grades 4 –12.	f. Ensure the availability of educational and cessation support/resources across the region. Promote tobacco free public places for children and families. Support was given to Drayton Valley community to pursue a Smoke Free bylaw. Promotional items and information were included in prenatal classes, Nutritious Beginnings Program, Healthy Start Healthy children Program and Public Health Nurse contacts g. Work with AADAC, Health Canada, AB Cancer Board partner with "National Spit Tobacco Education Program from the United States in development of an Alberta Spit Tobacco Education Program
10.Capital	a. Capital health Authority is pursuing policy change both within and external to the organization that will hopefully lead to a decreased rate of smoking among all populations groups in the region. b. Tobacco Control — Capital Health has implemented as internal policy and providing cessation support to staff and patients. North East area intent is to decrease exposure to second hand smoke in public and private places. Support for the programs in school such as *Teaming Up for Tobacco Free Kids.*	Assisting municipalities with the development of increased smoking restrictions for public places. Funding has been received to work with families to reduce the exposure of infants to secondhand smoke. c. Strathcona County Community Health Council advocated for a more comprehensive no-smoking bylaw to improve public health in their community. Strathcona County and Elk Island Schools to implement phased-in smoking ban. Community Health Councils continue to promote the need for non-smoking bylaws banning smoking in all public places accessible to children with the intent of improving public health. d. Supported Government Interdepartmental Committee on Tobacco Reduction strategy.
11.Aspen	Many Aspen programs target smoking cessation/reduction. a. Breathing for Two (Tobacco cessation during Pregnancy) b. Kick the Nic tobacco cessation prevention /education program for students	d. A display "Your Guide to A Smoke Free Future" for use at diabetes and heart health education events. e .Alberta Tobacco Reduction Alliance

	c. Tobacco Reduction and cessation with a focus on Youth. Partner with ADDAC to operationalize the "Alberta Tobacco Reduction Strategy".	(ATRA) smoking cessation survey. f. Working with Aspen Health promotion staff re: Tobacco reduction resources and programs.
12.Lakeland	Not available	Not available
13.Mistahia	The VP Regional Health Services Serves on the Alberta Tobacco Reduction Alliance Board, the Director of Health Promotion serves on working committees. The Region is working with community partners to have a plebiscite regarding smoke-free spaces for children on the municipal election in Oct. 2001 Bylaw passed for smoke-free spaces in restaurants and public places for children.	Strategy to expand initiatives to reduce the use of tobacco products with emphasis on Youth. An interactive teaching kit was developed and is in use by local teachers. Partner with ADDAC to help tobacco reduction. Encourage municipal non-smoking bylaws throughout the Region. Partner with ADDAC to provide tobacco education and cessation support for pregnant women receiving prenatal education.
14.Peace	Expand initiatives to reduce the use of Tobacco products by Albertans with the emphasis on youth. Collaborate with ADDAC for tobacco reduction.	Continue ongoing activities such as Smoke Talk, smoking cessation kits and work in schools. Peace Adolescent Total Health (PATH)
15.Keeweetinok Lakes	Over half of the region's population over 18 smokes cigarettes and almost two thirds use tobacco of some sort. a. School education program/education (grades 3-7) by Health Promotion Team at least once a year. b. Supports the Youth Action and Advocacy Project initiated by the Alberta Tobacco Reduction Alliance..	c. Increase emphasis on tobacco cessation during pregnancy through the Prenatal Nutrition Program. d. Collaborate/partner with ADDAC and schools to develop effective strategies that increase knowledge and understanding of how tobacco causes illness/disease.
16.Northern Lights	Reduce the use of Tobacco products with the emphasis on youth. a. Provide ongoing leadership and support for the Wood Buffalo Tobacco Reduction Coalition coordinator to support cessation programs. b. Implement the phased in Facility Smoke Free policy (2002-2004).	c. Dangers of smoking during pregnancy presented in conjunction with the "Food for Two Program". d. Board members continue their work on the "Clean Air Advisory Committee to effect change in the Regional Municipality of Wood Buffalo's non-smoking bylaw. (committee work completed in the fall of 2000.
17. Northwestern	a. Expand initiatives using protection, prevention and cessation strategies to reduce the use of tobacco products with an emphasis on youth.	b. Expand Programs for youth 2002 – 2005 c. Collaboration with AADAC 2002-2003